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ADDRESS TO THE ROYAL GEOGRAPHICAL SOCIETY.*

By the Right Hon. EARL CURZON OF KEDLESTON, G.C.S.I., G.C.I.E., President.

The past year has been a memorable one in the annals of our Society. It has contained great and startling events in the history of Polar Exploration, and it has been marked by domestic changes which must profoundly affect our future work and organization. I will deal with each of these topics in turn.

The shrinkage of the Earth and the control of the forces of nature by the organized skill of man has not, since the days of the Tudors, made a greater advance in a single decade than during the last ten years, which have witnessed the conquest of the two Poles of the Earth by human explorers, and the discovery of the art of aerial navigation by bodies heavier than the air. No predecessor of mine prophesied ten years ago that the successful discoverers of both Poles would, within so short a time, be telling the story of their triumphs to our Society; and when poor Andrée started in a balloon for the North Pole from Spitsbergen, and drifted away to destruction, few could have anticipated that an aerial machine capable of being driven by mechanical agency in an almost direct line even to a Polar destination (though this has not yet been attempted), would be produced in the near future.

And yet all three achievements were humanly certain to be accomplished, viewing the immense advance in scientific discovery as applied to aviation, and the extended knowledge and vastly superior resources with which Arctic or Antarctic explorers were about to enter upon their task. Peary did not mean to desist from his life's effort until he had

* Anniversary Meeting, May 26, 1913.

conquered the North Pole; Scott's first expedition in the *Discovery*, and Shackleton's march to within 100 miles of the South Pole, made it clear that the goal was within reach, and, with due preparation, and a modicum of good fortune, could be attained.

A year ago we knew that the Norwegian, Captain Roald Amundsen, had been the lucky winner of the latter prize. I say "lucky" not in the least with the idea of minimizing the performance, which will always remain a model of swift and successful adventure, directed, with a wonderful combination of intuition and courage, to the attainment of a particular end; but because, as we now know, the margin between success and failure in Polar enterprise is a very narrow one, and in the last resort the issue is apt to be decided by fortune alone. Captain Amundsen visited England and related the story of his expedition in November last, and all who heard him in the Queen's Hall, or have since read his remarkable book, will congratulate him on his singular good fortune. The stars in their courses fought for him: blizzards, glaciers, crevasses, abnormal temperatures, accidents—all the vicissitudes attendant upon Antarctic exploration, abstained from troubling him, and he marched in a bee line to the Pole with a precision of movement almost like clockwork in its accuracy, and with an absence of setback or disaster unequalled in the history of Polar research. We rendered him the honour due to an intrepid and successful pioneer, and a year ago all our faces were turned to our own man—already, though we did not know it, lying in the frozen clutch of death in the Great Ice Barrier—but, as we thought and hoped, completing his third year of splendid and truly admirable work before returning in triumph in the present spring.

Captain Scott's labours and his fate have been so fully and recently discussed at meetings of our Society, and the public is so well acquainted with the main features of the tragedy, that it is unnecessary for me to dilate upon them this afternoon. It is impossible, however, to read the tale without realizing that he was beaten, not by some isolated catastrophe, still less by want of forethought or prevision on his own part, but by a combination of misfortunes, raining down one upon the other with a relentlessness that reminds one of a Greek play in its sombre fury—misfortunes in which animals and men were successively the victims, and in which every force of Nature seemed to join hands with an almost malevolent fate, in order to drive the party to destruction. It will, I am sure, be a consolation to the public to know that no effort will be made to disturb the bodies of the heroes in the place where they lie, and it is, I believe, the unanimous desire of their relatives, that at no time may this be attempted. In this country we can now devote ourselves, with the funds that have been so generously contributed from all parts of the world, to providing for those who have been left bereaved, to publishing the scientific and other results of the expedition, which will be done with a thoroughness and on a scale never previously attempted, and to commemorating the

dead in some appropriate and worthy manner. Some announcement may be expected before very long on all these points.

The Museum, which forms a conspicuous feature in our own new and spacious quarters in Kensington, will, I hope, contain some of the most interesting relics of this never-to-be-forgotten expedition. Mrs. Wilson has offered to me some of the water-colour sketches of her late husband, which are among the most beautiful works of art that I have ever seen; and when Lady Scott has made use of the diary of her husband for the book which she will presently take in hand, she tells me that she will place the original on loan with us, where she may be sure that we will cherish it as a treasure beyond price.

What I said just now about the risks and perils attendant upon Polar research has received a further and not less tragic illustration during the past few months. The admirably organized Australian expedition under Dr. Mawson, operating in a more northerly part of the Antarctic region, has lost two of its best men, and the leader only escaped by a display of fortitude and endurance almost without parallel in the history of exploration. In the next number of our *Journal* * Captain Davis will tell the story of the difficulties that he encountered in attempting to bring off Dr. Mawson's party from the inhospitable shores that extend from Cape Adare to Gaussberg, which is the scene of their labours. There Dr. Mawson and several of his competent staff have been left throughout the winter. They are well provided with all necessaries, and are not likely to be unmindful of the service which they set out to render to the cause of science. Indeed, an Antarctic expedition that has not the glitter of a Polar prize to lure it on has little to encourage it in its perilous wanderings or its scarcely less arduous imprisonment, except the hope of adding to the sum total of human knowledge. We look forward to opening our Session in 1914 with an account of his labours from Dr. Mawson's own lips.

Although both Poles have now been reached, and there remain no sensational incitements to divert competent explorers from unveiling the secrets that still lie hidden at both ends of the earth, it must not be imagined that Polar work is at an end. In the Antarctic it is to be hoped that others will be induced to follow Dr. Mawson's example, and devote themselves to mapping the contour of that continent, and investigating as far as possible its structure and past history and any indications that may exist as to its former extensions. Of the bulk of the interior we are still without knowledge, and a glance at the map will show the vast empty spaces between the fluttering and intermittent coast-lines. Who knows whether in the not remote future an explorer may be found with sufficient energy and adequate resources to cross the continent from Weddell Sea to the Great Barrier.

At the opposite end of the earth, in the Northern Polar region, another tragedy has to be recorded. This time the victims have been a German

* See *Geographical Journal* for June.

expedition which set out nearly a year ago, and, getting into trouble, was compelled to winter, with the result that most of its members perished, it is feared with little or no gain to science. Arm-chair geographers are sometimes disposed to complain that the days of adventure and risk in exploration are over. The past year gives the melancholy lie to such fireside fallacies. The toll of human life is still demanded and is still cheerfully paid. Should the day ever arise when it is not, then indeed may geographical societies shut their doors and hand over their work to an educational bureau of the State.

How irresistible is the call of the Poles may be seen from the geographical programme that already awaits us in the forthcoming year. The North Polar region is about to become the theatre of active investigation by at least three well-equipped exploring parties. Captain Amundsen, having settled the problem of the South Pole, proposes next year to resume his original enterprise, for which he had raised the funds in Norway and elsewhere. He will enter the ice through Behring Strait, and spend some five years in drifting over the Polar seas, sounding, dredging, and carrying out investigations in all departments of science interested. Within the next few weeks our friend Mr. Stefansson, who told us recently of his interesting experiences among the so-called white Eskimo, will also enter Behring Strait, not to shut himself in the ice, but to test the theory that somewhere between Behring Strait and the Pole is a great land mass, or possibly a group of large islands similar to those off the Arctic shores of America. It is gratifying to know that this is a purely Canadian enterprise, financed by the Canadian Government, which deserves our warmest congratulations on its appreciation of the value of scientific enterprise. Our old friend, Captain Robert Bartlett, who accompanied Admiral Peary to within a short distance of the Pole, will command the ship, the *Karlick*. But so large is the scientific staff that another ship will be employed to carry the expedition to its base of operations, if possible on the new land, should such be found to exist; if not, on one of the more northerly islands of the Arctic archipelago. Mr. Stefansson expects to be away for three years, and we may with confidence look forward to substantial results. Another well-equipped expedition is about to start from the other side, proceeding northward by Smith Sound, and endeavouring to reach Crocker Land, which Peary believed he observed on his expedition to the Pole. This is an American expedition under the command of Mr. Macmillan, who takes the place of Mr. Borup, another of Peary's companions, who was unfortunately drowned about a year ago.

Before leaving the American side, reference should be made to the celebration last autumn of the Jubilee of the American Geographical Society. The liberality of its Council and members is such that the Society is able to indulge in an expenditure that almost makes our mouths water. By these means it was in a position to invite representatives from all the leading Societies of the world to take part in an excursion from

New York to San Francisco, the Society defraying the expense. Our Society was represented by three geographers, Mr. G. G. Chisholm, Mr. H. O. Beckit, and Mr. Alan G. Ogilvie, who will render an account of their visit to the principal landmarks of American scenery at our last meeting this session.

In South America there is considerable exploring activity by American and other geographers. We have just received news from Dr. Hamilton Rice, a pupil of Mr. Reeves, the Society's instructor, of his work in the upper basins of the Orinoco and Amazon. If successful in carrying out the rest of his programme, he is likely to supply really valuable data for the mapping of this little-known part of the South American interior.

In Africa there has been during the past year no outstanding event in the exploration of that continent, from which the darkness that enshrouded it within the lifetime of many of us is fast melting away. Special attention has been paid to the interesting region in British East Africa of which the Lorian swamp is the centre. More than one paper on the subject has appeared in the *Geographical Journal*, and quite recently one of the most accomplished of our younger geographers, Mr. Dracopoli, has made a thorough study and survey of the region, the results of which he will place before us at our next ordinary meeting.

Events have attracted attention during the past year to Tripoli and Morocco, considerable changes in the political geography of which have taken place. These are certain to be followed by additions to our knowledge of the physical and economic conditions of those two interesting countries, which are still in parts almost unknown.

In Asia, as in Africa, there have been no expeditions in the past year of a scale and character to be compared with those of Dr. Sven Hedin and Sir Aurel Stein, but in both continents there is widespread exploring activity, and, as a rule, of a kind more scientific than the pioneer journeys of the past. Some of the results of the Abor expedition in the mountain region between the Brahmaputra and Tibet on the north-east frontier of India have been placed before us during the past twelve months. We have still to receive a detailed account from Captain Leachman of his remarkable journey diagonally across Arabia, for which he received a subsidy from our Society.

A further interesting event of the past year was the session of the International Geographical Congress at Rome, in March last. Its postponement—for it was originally to have met eighteen months ago—may, to some extent, have influenced the attendance at the Congress; but a fair amount of good work appears to have been done. There was an interesting discussion on the International Map of the World which has now been in hand for some years; improvements in the methods originally adopted have been suggested, and it is hoped that before long a conference may meet in Paris to consider these points. The Congress, for the first time in its history, will hold its next meeting in St. Petersburg.

Satisfactory progress continues to be made in the status and methods

of geography in this country. It is acquiring a stronger position in the universities, which may be taken to indicate that the standard aimed at by our geographers in the younger generation is steadily on the rise. I am hopeful that, with the increased facilities that will be offered by the new premises of our Society, we ourselves may be able to do even more than we have done in the past, not only to popularize geography, but to maintain it at a high level as a method of scientific investigation. The mention of our new habitation tempts me to make a few observations on that and other domestic topics before I conclude.

A year ago I was in a position to state that I had already raised a sufficent amount of money by appeals to our Fellows, to the public, to powerful bodies, to our own Government, and to foreign and Colonial Governments, to justify Council in proceeding to the purchase of new and larger premises. But it was not until two months after our Annual Meeting that the splendid property of Lowther Lodge, with its fine house and extensive garden—a veritable private oasis in Kensington—having come into the market, we realized that here was an opportunity not to be lost. It soon appeared that the house itself could be adapted with but slight alterations, and at no great cost, not only to our present needs, but to the fullest possibilities of expansion for many a year to come, while the spacious and beautiful garden, after providing amenities for our Fellows, which under no previous scheme had we dreamed of, would furnish us with securing the means, if the lower half of the ground were sold, for carrying out that which has also been an unrealized and seemingly unrealizable dream for the last quarter of a century, a Lecture Hall of our own.

This part of our programme has necessarily been postponed unti we should have completed the more urgent task of adapting and moving into the main building. We opened on April 14 last; and, now that we have shaken down into our new surroundings, it is, I believe, the unanimous feeling, not only of our staff, but of all our Fellows who have so far visited the place, that we have secured a habitation well worthy of our position and repute as a Society, and singularly well suited to the prosecution of our work. We are not, it is true, so near to the heart of the West End as we were in our old quarters in Savile Row. But an excellent service of motor buses passes our doors; the Underground and Tube Railway services are contiguous; and we enjoy a light, an air, a tranquillity and a scope to which we were strangers in our former situation. These advantages have been quickly recognized by all those who work on the spot, whether it be in the map room, the library, the instruction room, or the observatory; and already one begins to wonder how ever we managed to get along in the cribbed and cabined environment of Savile Row. Furthermore, South Kensington is becoming increasingly the home of the scientific and educational work of London, and this concentration of activity will be advantageous both to ourselves and others. Our large and airy rooms, and the extensive garden, will enable us to be at home to

the entire body of our Fellows next month, and we propose to hold our annual reception there on June 25.

Perhaps I may add a few words on the special features which I am anxious that the new building should present. The first point to be considered has been the scientific work of the Society. Here our map room accommodation, both for study, drawing, mounting and storage, and our facilities for instruction are really excellent and admit of almost indefinite expansion. We have provided our Fellows, not only with a large reading-room or general library, but also with a private or student's library, in addition to the working library, where the catalogue is to be found. Storage has been provided in the passages, on the upper floors, and in the roomy basement for the inevitable growth of our already very large collection of books, and these will be, not merely more accessible, but much better shown than before. In addition, I could see no reason why our Fellows should not be made comfortable, and having furnished them with smoking room, writing room, and tea room, all of which will, I hope, be very soon in working order, I shall, I hope, have convinced them that Science is not the worse for wearing an attractive social garb.

A few other features are quite new. The entrance hall has been converted into a museum, where I have placed such relics and trophies as we already possess, and where, I hope, before I lay down my office, to have assembled a really interesting and valuable collection of objects connected with the history of exploration, including, as I mentioned earlier, some of the most precious relics of the Scott expedition. Here, too, I am making and hanging a complete collection of the portraits of our Gold Medallists; a similar collection of the portraits of our Royal Patrons and of our past Presidents having already been completed for the new Council room, while around the map room walls I have hung a number of oil paintings of famous explorers of the past.

We possess an enormous collection of photographs, presented to us by travellers. But hitherto these have reposed in boxes or drawers, unknown and unseen. We are building a new room in which a Photographic Exhibition will be constantly proceeding, different series being extracted from their retirement and exposed to view from time to time. Later on, when we have built our hall to contain an audience of 1000 or 1200 persons, we may possibly be able to have in the same building another room, devoted at intervals to exhibitions on a large scale of objects connected with particular expeditions, or with the diffusion of geographical knowledge. As our advantages develop and our numbers and means extend, I am hopeful that our educational activities may expand also, and that we may offer greater facilities, by lectures and otherwise, not merely to our Fellows but to the public. The handsome additional grant made to us by the Government seems to me to carry with it an enhanced duty to the nation.

In the early part of the present year we accomplished, I am glad to say, without friction, and by very general consent, another change, to the effect of which I look forward with similar confidence. I allude to the admission of women to our fellowship. I will not recapitulate the arguments that led myself and others to recede from the views that we held twenty years ago. The full consequence of the change cannot yet be seen. So far, however, we have found the type of woman that seeks election to be persons who have either travelled extensively, or are warmly interested in geography. Our present number of Lady Fellows, including the few who were elected in 1892, is not yet 100, and I do not anticipate that we shall be at all inconveniently crowded, much less overwhelmed. The main difference will be that several of those who have hitherto attended our meetings as guests will now do so of their own right, and that women who want to come and study or write on geographical subjects will enjoy facilities that have hitherto been denied to them. Their contribution to the resources of the Society will add to our power of usefulness in the future.

But I look even more to an increase in the number of our male Fellows as soon as the advantages of our new quarters are more widely known. I see no reason why we should not have at least 500 more male Fellows at no very distant date, and I am convinced that every penny of additional income that we thereby receive we can profitably devote to the strengthening of the position of geography in this country and in the British Empire.

We have further placed our staff upon a pensionable basis, and are about to appoint an Assistant Secretary to relieve our Secretary of a portion of his labours.

I have drawn a somewhat rosy picture, ladies and gentlemen, of the present position and the prospects that lie before us. But if we reflect on the very considerable forward steps that have already been taken during the past two years, I think we shall be justified in looking to the future with good hopes and confidence, and it may be that the year of our removal to our premises in Kensington will one day be regarded as having inaugurated a new era in the history and activities of our Society.

THE BRITISH ANTARCTIC EXPEDITION.

RECEPTION AT THE ALBERT HALL.

On the evening of Wednesday, May 21, the members of Captain Scott's expedition who had arrived in England were received at a great meeting of the Society in the Albert Hall. About nine thousand people were present, and the following members of the expedition were on the platform: Commander E. R. G. R. Evans, C.B.; Surgeon E. L. Atkinson;

Lieut. W. M. Bruce; Lieut. V. L. A. Campbell; Mr. Francis Drake; Mr. Cherry Garrard; Mr. T. Gran; Mr. J. H. Mather; Mr. Cecil H. Meares; Mr. H. G. Ponting; Mr. Griffith Taylor.

A lecture on some of the leading events of the expedition was given by Commander E. R. G. R. Evans, C.B., R.N., who on the death of Captain Scott succeeded to the command. The lecture was illustrated by slides and cinematograph films from the beautiful photographs taken by the official photographer of the expedition, Mr. H. G. Ponting.

The President, Earl Curzon of Kedleston, who was in the chair, made the following introductory remarks:—

At the Meeting of our Society in the end of February last, we paid our tribute to the five brave Englishmen who cheerfully laid down their lives in February and March, 1912, after winning their way to the South Pole. Their names will always live in the annals of British exploration and among the great deeds of the British race. I need not repeat to-night what we then said in their honour, endorsed as it has been by the verdict of the civilized world. To-night we are met to welcome the survivors, and to hear from the lips of their Commander the record of the expedition which culminated in such mingled triumph and disaster, but which will be for ever remembered, not merely for its crowning tragedy, but for its splendid tale of work accomplished and results achieved. If there should be any here present inclined to think that this great reception is inconsistent with the feelings of sorrow which affect us all as we contemplate the fate of Captain Scott and his four comrades, I would ask him to abandon such a reflection. Those who knew Captain Scott best are convinced that what we are doing to-night is exactly what he would have wished us to do. His unselfish nature would have rebelled against the idea that the survivors should not receive their meed of honour because he had fallen, or that the record of the Expedition should not be given to this Society and to the public at an Albert Hall meeting because he was not here to deliver the message and to acknowledge the cheers. The recollection of Scott and his companions tinges our proceedings to-night with some inevitable sadness; but we should not forget that, even before he laid down his life, the work for which he sacrificed it was done, and that we are welcoming back to England one of the most, perhaps the most, efficient, complete and successful expedition that ever started in quest of either of the Poles of the earth, and that the men who are seated behind me in this Hall to-night, to hear the narrative of their Commander, are men who have not only dared and suffered, but have accomplished that which entitles them to the gratitude of their countrymen and the admiration of the world. Such, as his dying message showed, was Scott's own opinion about them. He was always thinking of the Expedition and not of his personal share in it. Even when he learned that a rival was in the field and might possibly be beforehand in securing the prize, he did not change his plans by one hair's breadth, but persisted

steadily with his own organization, which was directed to the attainment of scientific results and not of personal glory. When these results are published they will provide a contribution of the first rank to our knowledge of the Antarctic continent and seas, and this will be the real monument to Scott and his men, far more than sculptured effigies or carved inscriptions.

I have read the paper which Commander Evans is about to deliver, and in one respect only have I any complaint to make of it, namely, that it gives an inadequate idea of the privations and sufferings endured by his companions and himself. When you see the magnificent slides and films taken by the talented photographer of the party, Mr. Ponting, and see the glories of the Polar ice and snow, you must not forget the other side of the picture, the risks incurred, the strain involved, the appalling hardships experienced, the constant battle with the pitiless elements, and that which was even worse, viz. disappointment, accident, and misfortune. Few of those who have returned but have been many times very near to death, from Evans, their Commander, who so nearly died from scurvy, to the members of the northern party, who were pulled through the Antarctic winter by their own resourcefulness and courage, and by the high and gallant spirit of their commanding officer, Lieut. Campbell. I ask you, ladies and gentlemen, to recognize that the heroes of this expedition are not only the men whose dead bodies lie in the icy tomb of the Great Barrier, but the men who are here to-night, both those whom I have already mentioned, and Dr. Atkinson, who nursed Evans at the base, and was in command at Cape Evans during the awful winter that followed the catastrophe; Mr. Cherry Garrard, who went out on the abortive attempt at relief and had previously made such splendid journeys with Dr. Wilson and Lieut. Bowers; Mr. Wright, the accomplished chemist and physicist of the party, and Lieut. Pennell, who did the most admirable work in the background in navigating the ship to and from the Antarctic and in marine surveys and exploration. Many others there are not less deserving of mention, including the brave seamen who never failed, whatever the test. May I not confidently affirm, ladies and gentlemen, that this meeting is not gathered here merely from idle curiosity to hear a tremendous tale of human adventure? We also desire to offer our tribute of admiration to the brave men who were its heroes, and along with our congratulations to them there goes from every heart in this crowded hall a silent message of sorrow, but sorrow not unmingled with pride, to those who mourn the departed.

In conclusion, may I, as President of the Society, express our thanks both for the liberality shown by the Government and for the splendid response to the appeal which has been made by the public in all parts of the British Empire?

I will now call upon Commander Evans to deliver his address.

THE BRITISH ANTARCTIC EXPEDITION, 1910–13.

By Commander E. R. G. R. EVANS, C.B., R.N.

So much has been published concerning the British Antarctic Expedition, the tragic loss of its gallant leader and his four brave companions, whose names we know so well, that there is no need to preface the story by telling you at length how Captain Scott made his preparations. His organization was complete, his equipment splendid, and no expedition ever left our shores with a better outfit or a more enthusiastic and determined personnel. Thanks to Captain Scott's fine organization our expedition remains self-contained, even after his death.

On June 1, 1910, the *Terra Nova* left London with most of the members of the expedition. She finally left New Zealand on November 29. Captain Scott had with him fifty-nine officers, scientists and seamen. The *Terra Nova* left New Zealand a very full ship; besides four hundred tons of coal she carried provisions for three years, two huts, forty sledges, fur sleeping bags, bales of clothing, all kinds of instruments, and the hundreds of little items of equipment necessary to a Polar expedition with an ambitious scientific programme. Besides these things which filled our ship's holds and the between deck spaces, we carried nineteen Siberian ponies, thirty-four dogs, three motor sledges, 2500 gallons of petrol, and our paraffin on the upper deck. The animals were under the charge of Mr. Cecil Meares, who with Lieut. Bruce had brought them down from Siberia. The ponies after we left New Zealand were taken charge of by Captain Oates, of the Inniskilling Dragoons.

The first exciting incident on the southward voyage occurred on December 2, when we encountered a gale which, in the deeply laden condition of the ship, nearly caused the loss of the expedition. First the engine-room choked, and then the hand pumps. Heavy seas washed over the vessel, and fires had to be extinguished as the engine room was feet deep in water. While the pump suctions were being cleared the afterguard formed a bucket discharge party and baled the ship out continuously for twenty-four hours. At the end of this time the gale abated, and we proceeded southward, having come through with no loss save two ponies, and one dog which was drowned.

Proceeding south on the meridian of 179° W., the first ice was seen in lat. 64°. The ship passed all kinds of icebergs, from huge tabular to little weathered water-worn bergs. The Antarctic pack was reached on December 9, in lat. 65° S., and the ship boldly pushed through for some 200 miles under steam and sail, when her progress was retarded to such an extent that, to save coal, engines were stopped, sail was furled, and the ship lay under banked fires for some days. We spent three weeks in the pack, and emerged on December 30, after pushing through 380 miles of ice. The time was not wasted: magnetic observations, deep-sea soundings,

and serial sea-temperatures were obtained. The zoologists and marine biologists secured valuable specimens. Once in open water we proceeded full speed to Cape Crozier, as Dr. Wilson wished to study the embryology of the Emperor penguins during the winter season. Captain Scott was quite prepared to make Cape Crozier our base, if a suitable landing-place was to be found. As no good place was to be seen, we rounded Cape Bird at midnight and entered McMurdo Sound. It was remarkably clear of ice. We passed Shackleton's winter quarters, and noticed his hut at Cape Royds looking quite new and fresh. Six miles farther south the ship brought up against the fast ice, which extended right across the Sound.

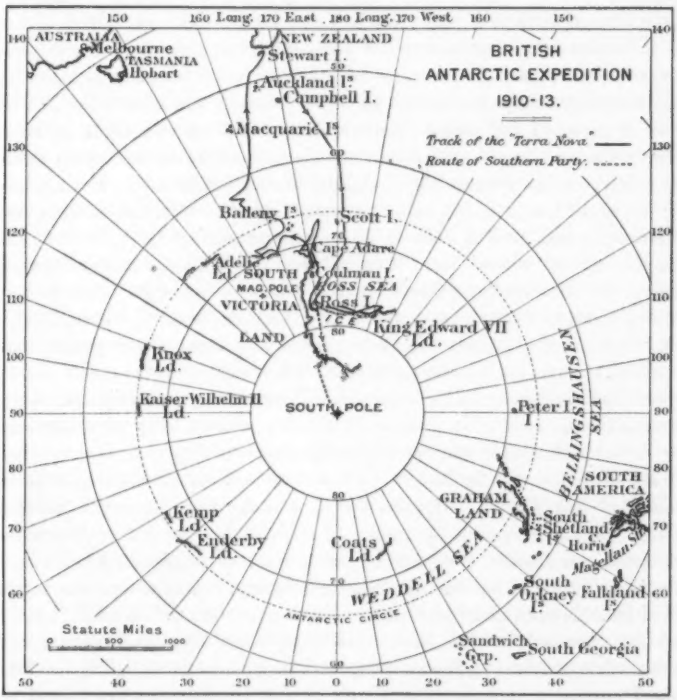
On January 4, 1911, thirty-six days out from New Zealand, Captain Scott, Wilson, and myself went across the ice and visited a little cape which looked, and subsequently proved to be, an ideal spot for wintering. This place Captain Scott named Cape Evans. Immediately the winter quarters were selected, out came the stores and transport. Lieut. Pennell took charge of the ship, Lieut. Campbell the transport, over the mile and a half of sea-ice; the charge of the base was given to me, while Captain Scott supervised, planned, and improved.

Meares' dogs, Oates' ponies, and Day's motors supplemented by man-hauling parties bustled between ship and shore, transporting stores over the frozen sea. At the cape, Davis, the carpenter, with his willing crew, put up the tent. In less than a week the main party had their equipment ashore.

We will now follow Captain Scott and his companions at the principal base. The weather was so hot when first we landed, that the ice melted and we could wash in fresh water, and even draw our drinking-water from a cascade. We built ice-caves to stow our fresh mutton in, and for magnetic observations. Outside the hut we soon had fine stables. Directly the construction of the base station was assured, away went every available man to lay a depôt. We said good-bye to the ship, and on January 24, 1911, Captain Scott and eleven companions left with two dog teams and eight ponies to lay out a depôt of foodstuffs before the Antarctic winter set in. Nearly one ton of provisions was taken out to a point 144 miles from our base. This spot was named One Ton Depôt. The party for the return journey was split up into three detachments. Captain Scott with Meares, Wilson, and Cherry Garrard, came home with the dogs. Scott and Meares had the misfortune to run along the snow bridge of a crevasse. The bridge gave way, and all the dogs but Osman, the leader, and the two rear animals, disappeared down a yawning chasm. With the greatest difficulty the dogs were rescued. Scott and Meares were lowered by Wilson and Cherry Garrard into the crevasse. They found the dogs twisting round suspended by the harness, fighting, howling, and snapping. One by one they were freed from the trace and hauled up on to solid ice; as each animal regained safety he lay down and slept. It was an anxious

period for all concerned. Captain Scott spoke most highly of Wilson, Meares, and Cherry Garrard's behaviour and resource on this occasion.

One party, consisting of the second in command and two seamen, returned from the depôt journey with the three oldest and weakest ponies —Blossom, Blucher, and James Pig. The ponies were in very poor condition, and Oates, their master, expected all three to give out on their return march. They were christened by the seamen "The Baltic Fleet." Two of them died owing to the severe weather conditions that obtained at the end of February, but the third pony, James Pig, was a plucky little



animal, and he survived. Lieut. Bowers, in charge of the detachment which built up "One Ton Depôt," returned after the other two parties. He had with him Cherry Garrard and Crean, when on March 1 he was sent across the sea-ice to reach Hut Point. The ponies were tired and listless after their hard journey and in bad condition, and they had to be frequently rested. As they advanced towards Hut Point cracks in the ice became apparent, and when the party reached a crack which showed the ice to be actually on the move, they turned and hastened back—but the ice was drifting out to sea! The ponies behaved splendidly, jumping

the ever-widening cracks with extraordinary sagacity. Bowers, Cherry Garrard, and Crean launched the sledges back over the cracks in order not to risk the ponies' legs. Eventually they reached what looked like a safe place. Men and ponies were thoroughly exhausted. Camp was pitched, and the weary party soon fell asleep. Bowers soon awoke, hearing a strange noise. He found the party in a dreadful plight—the ice had again commenced to break up, and they were surrounded by water. One of their four ponies had disappeared in the sea. Camp was again struck, and for five hours this noble little party fought their way over three-quarters of a mile of drifting ice. They never thought of abandoning their charge, realizing that Scott's Polar plans might be ruined if four more ponies were lost with their sledges and equipment. Crean, with great gallantry, went for support, clambering with difficulty over the ice. He jumped from floe to floe, and at last climbed up the face of the Barrier from a piece of ice which touched the ice-cliff at the right moment. Cherry Garrard stayed with Bowers at his request, for little Bowers would never give up his charge while a gleam of hope remained. For a whole day these two were afloat, and eventually Captain Scott, Oates, Gran and Crean appeared on the Barrier edge, and on seeing them Bowers and Cherry Garrard jumped some floes till they reached a piece of ice resting against the Barrier face, thanks to the return of the tide. Bowers and Cherry Garrard were rescued, and after a further piece of manœuvring, a pony and all the sledges were recovered. The other three ponies were drowned. During this trying time Killer whales were about almost continuously, blowing and snorting in the intervening water spaces. Only those who had served in the Antarctic can realize fully what Bowers' party, and also Scott's own rescue party, went through.

By March 4 all the depôt parties were safely, if not comfortably, housed at Hut Point, with the two dog teams and the two remaining ponies. We were unable to return to Cape Evans for six weeks, as the sea would not freeze over properly on account of persistent high winds. We lived in the old hut left by the *Discovery*, and our existence was rather primitive. Meares and Oates perfected a blubber stove. We killed seals, and thus obtained food and fuel. Although rather short of luxuries, such as sugar, we were never in any great want of good plain food, and the time passed agreeably enough. On March 14, the Depôt party was joined by Griffith Taylor, Debenham, Wright, and Petty-Officer Evans.

Taylor's party had been landed by the *Terra Nova* on January 27, after the start of the Depôt party, to make a geological reconnaissance. They traversed the Ferrar glacier, and then came down a new glacier, which Scott named after Taylor, and descended into Dry Valley, so called because it was entirely free from snow. Their way led over a deep freshwater lake four miles long, which was only surface frozen. This lake was full of algæ. The gravels below—a promising region of limestones, rich in garnets—were washed for gold, but only magnetite was

found. When Taylor had thoroughly explored and examined this region, his party retraced their footsteps and proceeded southward to examine the Koettlitz glacier. They returned from the Koettlitz glacier along the edge of the almost impenetrable pinnacle ice, and part of their journey actually led them through an extraordinary and difficult ice-field. It took two days to negotiate 6 miles of this surface; the party were then able to get back on to sea-ice, and without mishap marched to Hut Point.

We now numbered sixteen at this congested station, and 15 miles of open water separated us from Cape Evans. The gales were so bad that spray dashed over the hut sometimes, and all round the lowlying parts of the coast spray ridges of ice formed. But at last ice formed which was not blown out, first in little pancakes, which cemented together and formed floes, these in their turn were frozen together, and at last a party of nine made the passage over the new sea-ice to Cape Evans, and on April 13, 1911, they marched into the hut at our main base, dirty but cheerful. The cook soon had all kinds of luxuries prepared for us. Captain Scott was delighted at the progress made by those left in our hut under Dr. Simpson.

And now that communication was established between Hut Point and Cape Evans, we settled down for the winter. Thanks to Ponting, our photographic artist, we have a magnificent pictorial record of events. Ponting went everywhere with his camera and kinematograph machine. Even when we came South in the ship he kinematographed the bow of the *Terra Nova* breaking the ice. If a sledge-party set out, a penguin appeared, or a pony "played up," or even if a dog broke adrift, Ponting was there with his artillery, ready for action. He even had a galloping carriage with his quick-firing cameras drawn by dogs. He would get seals to pose for him if he wished, by his persuasive methods, or by exciting their curiosity. Ponting never missed an opportunity of making an artistic photograph.

We must now hurry through four months' darkness. The first winter seemed to pass very quickly. Every one was busy at his special subject. Dr. Wilson, the chief of our scientific staff, helped us all. He was our Solomon. To "Uncle Bill" we all went for sound practical advice. Wilson was a friend and companion to Captain Scott, and, indeed, to all in the Expedition.

During the winter months holes were made in the sea-ice through which we lowered a wire fish tray. By this means we caught a number of Notathenia. When Atkinson, the Helminthologist, had examined these fish, they were handed to the cook who served them up for breakfast. These fish were a great delicacy.

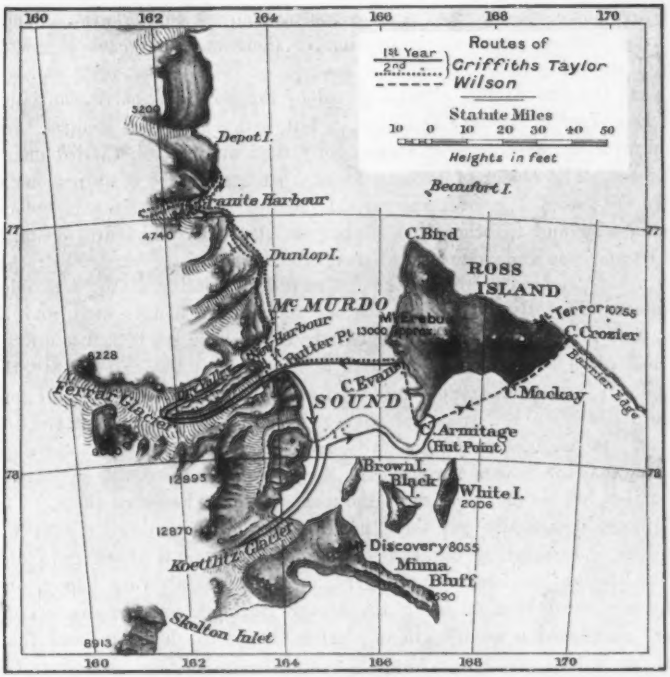
A small hut was erected some 50 yards from the main station to contain the magnetic observatory under Dr. G. C. Simpson of Simla. His place was at the base station; his important work as physicist and meteorologist prevented him from taking an active part in our sledge

journeys. When he was recalled to Simla in 1912, his work was ably continued by Wright, the Canadian chemist, who made a special study of ice structure and glaciation.

On June 27 Dr. Wilson, with Bowers and Cherry Garrard, started on a remarkable journey to Cape Crozier. Their object was to observe the incubation of the Emperor penguins at their rookery. During this first Antarctic mid-winter journey the temperatures were seldom above 60°, and they actually fell to 77° below zero, that is 109° of frost. The party took a fortnight to reach Cape Crozier, meeting with good weather—that is, calm weather—but bad surfaces, which handicapped them severely. After rounding Cape Mackay they reached a wind-swept area, and experienced a series of blizzards. Their best light was moonlight, and they were denied this practically by overcast skies. Picture their hardships—frozen bags to sleep in, frozen finneskoe to put their feet in every time they struck camp. They scarcely slept at all. And when they reached Cape Crozier, only about one hundred Emperor penguins could be seen. In the *Discovery* days this rookery was found to contain two or three thousand birds. Possibly the early date accounted for the absence of Emperors. However, half a dozen eggs were collected, and three of these are now in our possession. Wilson on his return told us that he picked up rounded pieces of ice which the stupid birds had been cherishing, fondly imagining they were eggs. The maternal instinct of the penguin is very strong.

At Cape Crozier, Wilson's party had built a stone hut behind a land ridge on the slopes of Mount Terror. This hut was roofed with canvas. The same night that the eggs were collected a terrific storm arose. One of the hurricane gusts of wind swept the roof of the hut away, and for two days the unfortunate party lay in their bags half smothered with fine drifting snow. The second day was Dr. Wilson's birthday. He told me afterwards that had the gale not abated, then they must all three have perished. They dare not stir out of the meagre shelter afforded by their bags. Wilson prayed hard that they might be spared. His prayer was answered; but, as you know, two of this courageous little band lost their lives later on in their eager thirst for scientific knowledge. When the three men crept out of their bags into the dull winter gloom they groped about and searched for their tent, which had blown away from its pitch near the stone hut. By an extraordinary piece of good fortune it was recovered, scarcely damaged, a quarter of a mile away. Wilson, Bowers, and Cherry Garrard started home the next day. They were caught by another blizzard, which imprisoned them in their tent for forty-eight hours. After a very rough march, full of horrible hardships and discomforts, the little band won through and reached Cape Evans on August 1, having faced the dreadful winter weather conditions on the great ice barrier for five weeks. Cherry Garrard is with us to-night. He was Wilson's special friend amongst the younger members. On their return

they wanted bread, butter, and jam most, and loaves disappeared with extraordinary speed. They were suffering from want of sleep, but were all right in a few days. A remarkable feature of this journey was the increase of weights due to ice collecting in the sleeping-bags, tent, and clothing. The three sleeping-bags weighed 47 lbs. at the start, and 118 lbs. on their return. Other weights increased in the same proportion, and their sledge had dragged very heavily in consequence. The three men when they arrived in the hut were almost encased with ice. I well remember undressing poor Wilson in the cubicle he and I shared. His clothes had almost to be cut off him.



From this journey we derived additional experience in the matter of sledging rations. Thanks to the experiments made, we arrived at the most suitable ration. This was for the colder weather expected during the second half of the forthcoming Polar journey. It was to consist of 16 ozs. biscuit, 12 ozs. pemmican, 3 ozs. sugar, 2 ozs. butter, 0·7 oz. tea, 0·6 oz. cocoa—equals 34·4 ozs. food daily. This is one man's food per day. No one could possibly eat this in a temperate climate; it was a fine filling ration even for the Antarctic. The pemmican consists of beef extract with 60 per cent. pure fat.

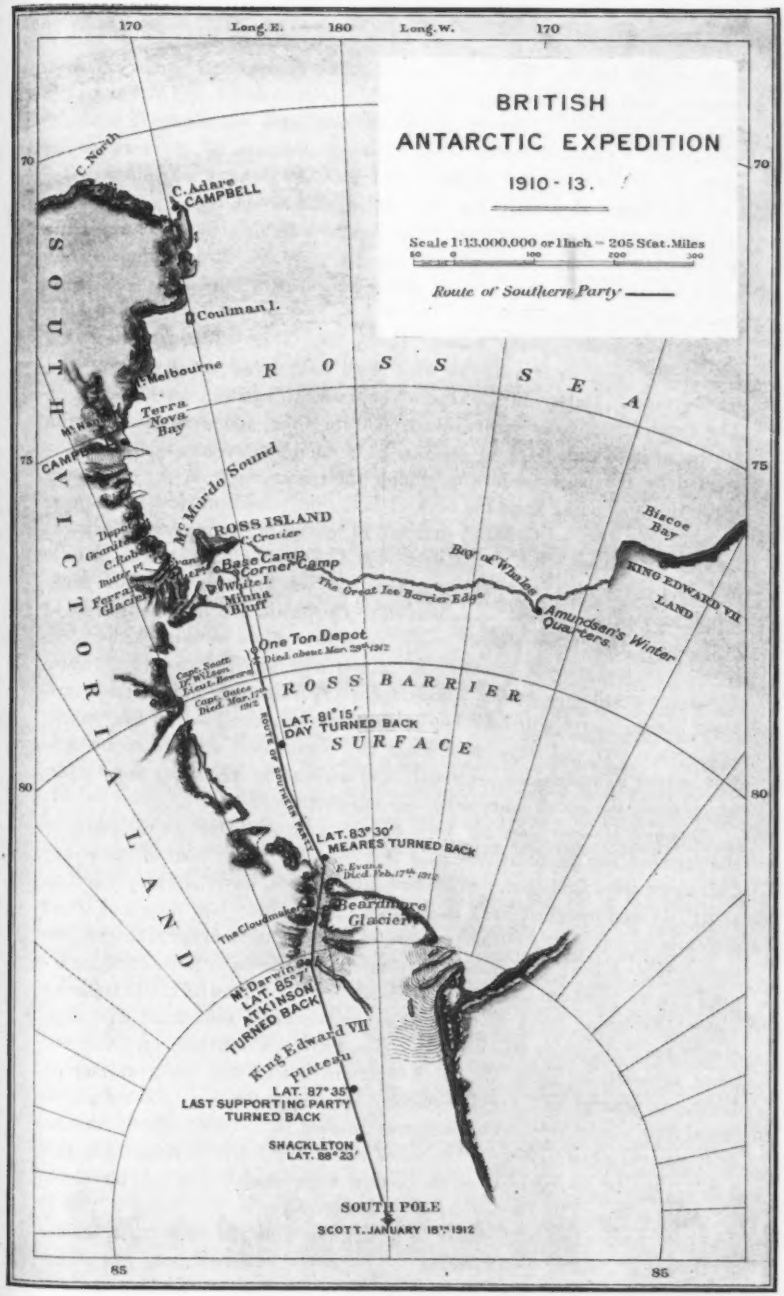
No casualties occurred during the winter, but Dr. Atkinson had a severely frostbitten hand. He had gone out to read a thermometer on the sea-ice 800 yards from our hut. It was blowing and drifting, and Atkinson lost his way in a blizzard. He was adrift for eight hours, but luckily found his way back during a lull in the weather.

During the second half of the winter we were all busy preparing for the sledge expedition to the Pole. Food rations had to be prepared, instruments calibrated, sledges specially fitted to carry the travelling equipment, and our own clothes adapted for sledging according to experience gained in the depôt and winter journeys. Meares and the second in command took parties out and laid depôts during the early spring, and Captain Scott made a coastal journey to the west. These spring journeys were all interesting in their way, but cannot now be dwelt on owing to time limit.

On October 24 the advance guard of the Southern party, consisting of Day, Lashly, Hooper and myself, left with two motor sledges. We had with us three tons of stores, pony food and petrol, carried on six sledges. The object of sending forward such a weight of stores was to save the ponies' legs over the variable sea-ice, which was in some places hummocky, and in others too slippery to stand on. The first 30 miles of Barrier was known to be bad travelling. The motor party had rather trying experiences, owing to the frequent over-heating of the air-cooled engines. Directly the engines became too hot we had to stop, and by the time they were reasonably cooled the carburetter would refuse duty—it had often to be warmed up with a blow-lamp. Day and Lashly, the engineers, had great trouble in starting the motor-sledges. We all four would heave on the spans of the towing-sledges, to ease the starting strain; the engines would generally give a few sniffs, and then stop. It is true that the motors advanced the necessaries for the Southern journey 51 miles, but at the expense of the men who had charge of them. The engineers continually got their fingers frost-bitten tinkering with the engines and replacing big end brasses, which several times gave out. But although the temperatures were low, we were all very happy, and Day was most keen to bring the motors through with credit. They were abandoned a mile south of Corner Camp, but had advanced their weights in turn over rough, slippery and crevassed ice, and thus given the ponies a chance to march light.

The first 30 miles of barrier surface led over very deep soft snow, and, in fairness to the despised motors, they went better over soft snow than any other part of our transport. The man-hauling party, as we now became, marching for a fortnight, covered nearly 180 miles, and halted at a rendezvous on November 15 in lat. 80° 32′ south. We waited here six days, and built an enormous snow cairn 15 feet high. We called this rendezvous Mount Hooper, after our youngest member.

On November 21, Captain Scott arrived with eleven men, ten ponies


BRITISH
ANTARCTIC EXPEDITION
1910 - 13.
Scale 1:13,000,000 or 1 Inch = 205 Stat. Miles
Route of Southern Party
170
Long. E.
180
Long. W.
170
70
75
80
85
C. North
C. Adare
CAMPBELL
Coulman I.
Mt. Melbourne
Terra Nova Bay
CAMP
Mc Murdo Sound
ROSS ISLAND
C. Crozier
Hut Point
Base Camp
Corner Camp
White I.
Minna Bluff
The Great Ice Barrier Edge
Bay of Whales
Amundsen's Winter Quarters
KING EDWARD VII LAND
Bircoe Bay
One Ton Depot
Died about Mar. 29th 1912
Capt. Scott
Dr. Wilson
Lieut. Bowers
Capt. Oates
Died Mar. 17th 1912
ROSS BARRIER SURFACE
LAT. 81° 15'
DAY TURNED BACK
ROUTE OF SOUTHERN PARTY
LAT. 83° 30'
MEARES TURNED BACK
E. Evans
Died Feb. 17th 1912
The Cloudmaker
Beardmore Glacier
Mt. Darwin
LAT. 85° 7'
ATKINSON
TURNED BACK
King Edward VII Plateau
LAT. 87° 35'
LAST SUPPORTING PARTY
TURNED BACK
SHACKLETON
LAT. 88° 23'
SOUTH POLE
SCOTT. JANUARY 18th 1912
SOUTH VICTORIA LAND
ROSS SEA

and two dog teams. We heard that they had been delayed partly by bad weather, and had purposely kept down the marches to give the weaker animals a chance. However, every one was well and eager to advance southward. Captain Scott ordered us to continue to go forward in advance of the dogs and ponies. We marched exactly 15 miles daily, erecting cairns at certain pre-arranged distances, surveying, navigating, and selecting the camping site. The ponies marching by night were able to rest when the sun was high and the air warmer. Meares' dogs would bring up the rear; they started some hours after the ponies, as their speed was so much greater.

Captain Scott's plans worked easily and well. The ponies pulled splendidly, and their masters vied with each other in their care and management. Oates always kept a very careful look-out on his charges. The tough little beasts pulled about 650 lbs. each, and were fed daily on 10 lbs. of oats and 3 lbs. of oilcake. On camping, large walls would be erected by the pony leaders to shelter their animals from the wind, and while this was being done the cook of each tent would prepare the supper hoosh. We were all so happy and full of life on the march over the great ice barrier that we often would wrestle and skylark at the end of the day. We had our good and bad weather, and we had our turns of snow blindness. This ailment was common to the ponies and dogs as well as to ourselves. Depôts were made every 65 miles. They were marked by big black flags, and we saw one of them, Mount Hooper, 9 miles away. Each depôt contained one week's rations for every returning unit. That outward barrier march will long be remembered—it was so full of life, health and hope. Our sad days came when the ponies were killed one by one. But hunger soon defeated sentiment, and we used to relish our pony meat, which made the hoosh more solid and satisfactory.

Day and Hooper were the first to return, their places being taken in the man-hauling party by Atkinson and Wright, whose ponies, Jehu and Chinaman, were first shot. With two invalid dogs, Day and Hooper left us at 81° 15′ and marched back to the base. With only two they had great difficulty in pulling their sledge home, so cut it in half and saved themselves considerable labour. On December 4 we arrived within 12 miles of Shackleton's Gap or Southern Gateway. We could see the outflow of the Beardmore glacier stretching away to our left as we advanced southward that day. Hopes ran high, for we still had the dogs and five ponies to help us. Captain Scott expected to camp on the Beardmore itself after the next march. Luck was against us. On December 5 we encountered a blizzard which lasted four whole days. The temperature rose to 35° Fahrenheit, and the drift was very bad indeed. The snow was in big flakes, driving from the S.S.E., but as the gale took its course snow was succeeded by sleet, and even rain. The barrier surface was covered with 18 inches of slush. The poor ponies had continually to be dug out from the snowdrifts, which accumulated behind their walls. The dogs suffered less, but they

themselves looked like wet rats when Meares and Demitri went to feed them. All our tents, clothing and sleeping-bags were soaked. On December 9 the blizzard was over, and all hands dug out sledges and stores. We wallowed sometimes thigh deep in this Antarctic morass, and after marching for fourteen days on end the remaining five ponies were shot, as no food was left for them. Poor things! they did their job well, and I believe every pony leader gave half his biscuits to his own animal, so they had some little reward for their last march.

As arranged, three teams of four, pulling 170 lbs. per man, now advanced up the glacier. Meares and his Russian dog-boy came along with us for two marches, and then turned homeward. To help us Meares had travelled further south than his return rations allowed for, and for the 450-mile northward march to Cape Evans he and his companion Demitri went short one meal a day, rather than deplete the depôts. It is a dreadful thing on an Antarctic sledge journey to forfeit a whole meal daily, and Meares' generosity should not be forgotton. The advance of the twelve men up the Beardmore was retarded considerably by the soft wet snow which had accumulated in the lower reaches of the glacier. Panting and sweating, we could only make 4-mile marches until the 15th. But after that the surfaces were better, and we were far less tired in doing more than twice the distances.

On December 16 we reached Blue Ice, 3000 feet above the barrier, and, with the exception of little delays caused by people falling into crevasses, our progress was not impeded. Wilson did a large amount of sketching on the Beardmore. His sketches, besides being wonderful works of art, helped us very much in our surveys. We had fine weather generally, and with twelve men the Beardmore glacier was overcome without great difficulty. Of course, we had Shackleton's charts, diaries, and experience to help us. We often discussed Shackleton's journey, and were amazed at his fine performance. We always had full rations, which Shackleton's party never enjoyed at this stage. Our marches from December 16 worked up from 13 to 23 miles a day.

On December 21 we were on the plateau in lat. 85° 7′ S., 6800 feet above the barrier, and fit and ready to go forward. Here we established the Upper Glacier depôt. The third supporting party, consisting of Atkinson, Wright, Cherry Garrard, and Keohane, left us the next day, and marched home 584 miles. They spent Christmas Day collecting geological specimens, and reached Cape Evans on January 28, after a strenuous journey of 1164 miles. They had some sickness in the shape of enteritis and scurvy. But Dr. Atkinson's care and medical knowledge brought them through safely.

Captain Scott with his two sledge teams now pushed forward, keeping an average speed of 15 miles a day with full loads of 190 lbs. a man. We steered south-west for the first two days after leaving the Beardmore, to avoid the great pressure ridges and icefalls which were plainly visible to

the south. On December 23 we came across enormous crevasses which were as big as Regent Street. They were nearly all well bridged with snow, but we took them at the rush and had no serious falls. The dangerous part is at the edge of the snow bridge, and we frequently fell through up to our armpits, just stepping on to or leaving the bridge. We experienced on this plateau the same tingling southerly wind that Shackleton speaks of, and men's noses were frequently frost-bitten. On Christmas Eve we were 8000 feet above the barrier, and we imagined we were clear of crevasses and pressure ridges. We now felt the cold far more, when marching, than we had done on the Beardmore. The wind all the time turned our breath into cakes of ice on our beards. Taking sights when we stopped was a bitterly cold job, fingers had to be bared to work the little theodolite screws, and in the biting wind one's finger-tips soon went. On Christmas Day we marched 17½ miles, and during the forenoon again crossed a badly crevassed area. Lashly celebrated his forty-fourth birthday by falling into a crevasse 8 feet wide. The laden sledge just bridged the chasm, and poor Lashly was suspended below spinning round with 80 feet of clear space beneath him. We had great difficulty in hauling him up on account of his being directly under the sledge. When he reached the surface, one of the party wished him a happy Christmas and another many happy returns. I will not tell you what Lashly's reply was.

At 7.30 we camped and had our Christmas dinner—extra thick pemmican with pony meat in it, a chocolate and biscuit hoosh, plum pudding, cocoa, ginger, and caramels, and a mug of water each. We were all so full that we could hardly shift our foot-gear, and although the temperature was well below zero, we lay on our sleeping-bags unable to muster the energy to get into them. The 87th parallel was reached on New Year's Eve, after a short march; we made a depôt here, and the seamen of the party converted the 12-foot sledges into 10-foot ones by the spare short runners we had brought along. This took nine hours, but the reduction in bearing surface was worth it. We saw the New Year in that night with a fine feed of pemmican and a stick of chocolate which Bowers had kept for the occasion.

On January 3, Captain Scott came into our tent and told us that he was sure that he could reach the Pole if my party gave up one man and made the homeward journey short-handed. Of course we consented, and Bowers was taken into the Polar party. On January 4 the last supporting party, consisting of Lashly, Crean, and myself, marched south to lat. 87° 34′ with the Polar party, and seeing that they were travelling rapidly, yet easily, we halted, shook hands all round, and said good-bye.

Up to this time no traces of the successful Norwegians had been seen, and we all fondly imagined that our flag would be the first to fly at the South Pole. We gave three huge cheers for the Southern party as they stepped off, and then turned our sledge and commenced our homeward

march of nearly 800 miles. We frequently looked back until we saw the last of Captain Scott and his four companions, a tiny black speck on the horizon, and little did we think that we were the last to see them alive, that our three cheers were the last appreciation they would ever know.

The return of the last supporting party nearly ended in disaster. After the first day's homeward march, we found that we could not do the necessary distances in the nine hours, owing to being a man short. This was serious, and in order not to make my seamen companions anxious, that night I handspiked my watch, putting the hands on one hour, so that we therefore turned out about 4 a.m., making from ten to twelve hours a day. On January 8 we were overtaken by a blizzard which continued for three days. We dare not stop our marches, and thanks to the wind being with us we were able to push on. But the soft snow spoilt the surface, and the outlook was so bad we cut off a big corner and saved two days' march, by shaping course direct for the Upper Glacier Depôt under Mount Darwin. This led us over Shackleton's ice-falls at the head of the Beardmore glacier. We descended many hundred feet, mostly riding on the sledge; we had frequent capsizes and broke the bow of the sledge. Crean had the misfortune to catch his trousers somehow in our headlong flight and had them torn to shreds. We reached the Upper Glacier Depôt the same day, however, and reclothed Crean, who had left a pair of Mandleberg wind-proof trousers in the depôt cairn with some of his tobacco wrapped up in them.

Returning down the Beardmore, we had some misty weather which hid the land, and we were embarrassed by getting into a mass of ice-falls, pressure ridges, and crevasses. We fell about a great deal and were two days getting clear. We had no food left, and when we reached the next depôt under Cloudmaker mountain we had marched 17 miles without anything to eat except one biscuit and a mug of tea. To make things worse, I developed scurvy about January 17, when we had 500 miles to go. My condition became daily more serious until I entirely lost the use of my legs. But I could not afford to give up as I was the only one in the party who knew anything about navigation, and I had to keep them marching until they could see Mount Erebus, or some known landmark. When 75 miles from Hut Point I ordered Crean and Lashly to leave me with my sleeping-bag and some food, and go on, sending out relief if possible. They refused to do this, and strapping me on the sledge, dragged me 40 miles in four days, helped by a southerly wind. When 35 miles from Hut Point we had a heavy snowfull, which made it impossible for Lashly and Crean to move the sledge.

Crean then left us on February 19, and marched for eighteen hours with nothing to eat but a few biscuits. He plodded on solidly through the soft snow, and eventually reached Hut Point utterly exhausted and numbed with cold; but he gave our whereabouts to Dr. Atkinson, who was there with Demetri and the dog-teams, and they came out and rescued us.

Lashly undoubtedly saved my life by his careful nursing. It was very brave of him to stay with me, as he only had three meals left, and if relief had not come in time he could never have walked in without food, as he himself was very done after hauling in my sledge-team for over 1500 miles. Crean volunteered to come out again with Atkinson, but was, of course, not allowed to.

And now we will turn again to the Polar party itself. They covered the 145 geographical miles that remained in a fortnight. Captain Scott came across Amundsen's dog-tracks soon after lat. 88°, and followed them to the Polar area. Scott, Wilson, Oates, Bowers, and Seaman Evans reached the South Pole on January 17, 1912. They fixed the exact spot by means of a 4-inch theodolite, and the result of their careful observations located the Pole at a point which only differed from Amundsen's by half a mile, as shown by his flag. This difference actually meant that the British and Norwegian observers differed by one scale division on the theodolite, which was graduated to half a minute of arc. Experts in navigation and surveying will always look on this splendidly accurate determination as a fine piece of work by our own people as well as by the Norwegian expedition.

Lady Scott has remarked on the magnificent spirit shown by her husband and his four specially selected tent-mates, when they knew that Queen Alexandra's little silk Union Jack had been anticipated by the flag of another nation. Scott and his companions had done their best, and never from one of them came an uncharitable remark. On January 19 the homeward march was commenced; the party had before them a distance of over 900 miles. They came back at a fine pace over the ice-capped plateau. A blizzard stopped them from travelling on January 25, but otherwise their progress was not retarded materially. Seaman Evans was causing anxiety, and his condition naturally worried Captain Scott and his comrades. But, however great their anxieties, they looked after Evans most carefully, and hoped to pull him through. He was rested on the Beardmore glacier, Oates looking after him while the others made a halt for geographical investigation by the Cloudmaker depôt. But Evans also sustained a serious concussion through falling and hitting his head, and then the party were greatly hampered. They were so delayed that the surplus foodstuffs rapidly diminished, and the outlook became serious. Bad weather was encountered, and near the foot of the Beardmore poor Seaman Evans died. He was a man of enormous strength, a tried sledger, and a veteran in Antarctic experience. Captain Scott had the highest opinion of this British seaman. He was the sledge-master, and to Evans we owed the splendid fitting of our travelling equipment, every detail of which came under his charge.

Seaman Evans' death took place on February 17, and then the bereaved little band pushed northward with fine perseverance, although they must have known by their gradually shortening marches that little hope of

reaching their winter quarters remained. Their best march on the Barrier was only 9 miles, and in the later stages their marches dropped to 3 miles. The depôts were 65 miles apart, and contained six weeks' provisions; they knew their slow progress was not good enough, but they could not increase their speed over such bad surfaces. The temperatures fell as they advanced, instead of rising as expected, and we find them recording a temperature of −46·2 one night.

Poor Oates' feet and hands were badly frost-bitten—he constantly appealed to Wilson for advice. What should he do, what could he do? Poor gallant soldier, we thought such worlds of him. Wilson could only answer, "Slog on—just slog on." On March 17, which was Oates' birthday, he walked out to his death in a noble endeavour to save his three comrades beset with hardships, and as our dead leader wrote, "*It was the act of a brave man and an English gentleman.*"

Scott, Wilson and Bowers fought on until March 21, only doing about 20 miles in the four days, and then they were forced to camp 11 miles south of One Ton Depôt. They were kept here by a blizzard which was too violent to permit them to move, and on March 25 Captain Scott wrote his great message to the public.

Thanks to Atkinson and the search party we have all the records of these brave men, and so the surviving members of the expedition can work on them, and for Scott's and Wilson's sakes particularly let us hope justice will be done to these same records.

I must now take you right away from the main party to give you an insight into Lieut. Victor Campbell's work. Campbell's party consisted of Surgeon Levick, Raymond Priestley, geologist, and Seamen Abbott, Browning, and Dickason. Lieut. Pennell, who now commanded the *Terra Nova*, took this expedition along the Barrier to King Edward's Land in the beginning of February, 1911. They got within 10 miles of Cape Colbeck, but the most formidable pack ice yet seen lay between them and the ice cliffs of this inhospitable-looking land. It was out of the question for Campbell to put his hut and gear out on to sea-ice, with no certain prospect of being able to climb the cliffs of King Edward VII. Land. So he and Pennell reluctantly returned to seek a landing elsewhere.

Coal was short, and the season drawing on. The *Terra Nova* steamed back along the face of the Great Ice Barrier, and in the Bay of Whales sighted the *Fram*. The two ships' companies soon made friends, and the commanding officers exchanged calls. Amundsen was anxious for Campbell to winter alongside of him, but Campbell decided to make his winter quarters in another region—it being undesirable to have two expeditions wintering at the same base. Campbell eventually landed at Cape Adare, after vainly searching for a more profitable wintering place. He was most handicapped by the shortage of coal in the *Terra Nova*, which limited the radius of their search.

Campbell and his party did excellent meteorological, geological, and

magnetic work, and he himself made some very good surveys. Levick made a special study of the penguins, and Priestley, with his previous Antarctic knowledge, made himself invaluable, apart from his own scientific work. Campbell was loud in his praise of the seamen in this party.

Lieut. Pennell, in the *Terra Nova*, revisited Cape Adare after the first winter, took off the party and their collections, and landed them again on January 8 at the Terra Nova bay, to sledge round Mount Melbourne to Wood bay, and examine this part of Victoria Land. Campbell and his crew returned, after a month's sledge journey to Terra Nova bay, on February 6. They had found garnets and many excellent fossils on this trip. Campbell did some very good work surveying, and has added a good deal to the existing maps.

On February 17, the party began to look for the *Terra Nova*, but as time went on and she did not put in an appearance, Campbell prepared to winter. Pennell, who had brought the *Terra Nova* back to pick this sledge team up, met with ice conditions that were insuperable, and never got within 30 miles of Terra Nova bay. Pennell, Rennick, and Bruce did all that any men could do to work their ship through, but communication was impossible that season, and so Campbell was left with only four weeks' sledging provisions to face an Antarctic winter. His party could not have been better chosen to help him through this ordeal. Campbell knew his men absolutely, and they themselves were lucky in having such a resourceful and determined officer in charge.

On March 1 Campbell selected a hard snow slope for their winter home, and into this they cut and burrowed until they had constructed an igloo or snow house, 13 feet by 9 feet. This they insulated with blocks of snow and seaweed. A trench roofed with sealskins and snow formed the entrance, and at the sides of this passage they had their store rooms and larder.

All the time this house was under construction a party was employed killing penguins and seals, for which they kept a constant look-out. By March 15 their larder contained 120 penguins and 11 seals. After this date gale succeeded gale, and the winter set in with a long run of bad weather.

Campbell and his companions led a very primitive existence here for six and a half months. They only had their light summer sledging clothes to wear, and these soon became saturated with blubber; their hair and beards grew and they were soon recognizable only by their voices. Some idea of their discomforts will be gleaned by a description of their diet. Owing to their prospective journey to Cape Evans, Campbell had to first reduce the biscuit supply from eight to two biscuits a day, and then to one.

Generally their diet consisted of one mug of pemmican and seal hoosh and one biscuit for breakfast. Nothing for lunch. One and a half mug of seal, one biscuit and three-quarters pint of thin cocoa for supper. On Sunday, weak tea was substituted for cocoa; this they reboiled for Monday's supper, and they used the dried tea-leaves for tobacco on

Tuesday. Their only luxuries were a piece of chocolate and twelve lumps of sugar weekly. They sometimes used tea-leaves and wood shavings for tobacco. They kept twenty-five raisins each for birthdays. One lucky find was thirty-six fish in the stomach of a seal, which, fried in blubber, proved excellent. The biscuit ration had to be stopped entirely from July to September.

The six men cooked their food in sea-water as they had no salt, and seaweed was used as a vegetable. Priestley did not like it, and no wonder, for it had probably rotted in the sun for years, and the penguins had trampled it all down, etc.

Campbell kept a wonderful discipline in his party, and as they were sometimes confined to the igloo for days, Swedish drill was introduced to keep them healthy. A glance at their weather record shows how necessary this was. We find one day snowing hard, next day blowing hard, and the third day blowing and snowing hard, nearly all through the winter. But there was never a complaint. On Sundays divine service was performed. This consisted of Campbell reading a chapter of the Bible, followed by hymns. They had no hymn-book, but Priestley remembered several, while Abbot and Browning and Dickason had all been at some time or other in a choir.

To add to their discomforts, owing to the state of their clothing and meagre food supply, they were very susceptible to frost-bites, and Jack Frost made havoc with feet, fingers and faces. Then sickness set in, in the shape of enteritis—Browning suffering dreadfully, but always remaining cheerful. The sickness was undoubtedly due to their meat diet, and its ravages weakened the party sadly.

On May 6 Campbell's party sustained a severe disappointment, for they saw what appeared to be four men coming towards them. Immediately they jumped to the conclusion that the ship had been frozen in and this was a search party. The four figures turned out to be Emperor penguins, and although disappointing in one way they served to replenish the larder, and so had their use.

Campbell and his five companions started for Cape Evans on September 30. Progress was slow and the party weak, but thanks to their grit and to Campbell's splendid leadership, this party all got through to the winter quarters alive. Browning had to be carried on the sledge part of the way, but fortunately they picked up one of Griffith Taylor's depôts, and the biscuit found here quite altered Browning's condition.

It seems a pity that full justice cannot be done to all the parties who went forth sledging in various directions, but a single lecture does not permit very full descriptions. Griffith Taylor, the Australian physiographer, with Debenham, Gran, and Seaman Forde, made a most valuable journey along the coast of Victoria Land for geological and surveying purposes. I hope Taylor will deliver a paper on this expedition at some future date. The work of the *Terra Nova* is also worthy of a

special lecture; and here I would like to say that Lieut. Pennell, her commander, Lieuts. Rennick and Bruce, Mr. Drake and Mr. Lillie, have worked incessantly in the ship and on the less frequented coasts of New Zealand for nearly three years. They have been ably and loyally assisted by the seamen and stokers of the *Terra Nova*—worthy fellows, whose bye-word has been, "*Play the game.*"

The PRESIDENT: We have decided not to have any more speech-making this evening, but I will ask you before you separate to join me in passing a vote of thanks to Commander Evans and his gallant comrades for the part that they have played in the moving drama which has been placed before us to-night, and to Commander Evans himself for the paper he has delivered to us. I think the matter which will have struck us most in listening to that paper was the fine and generous tribute that he paid to the men with whom he wrought and who are here with him this evening. Well deserved has that tribute been. I ask you, ladies and gentlemen, by clapping your hands to join with me in this final note of appreciation.

LOST GEOGRAPHICAL DOCUMENTS.*

By Sir CLEMENTS R. MARKHAM, K.C.B., F.R.S.

I HAVE thought that it might be of some slight service, in furthering the objects of the Congress, if I submitted to the consideration of this Sub-section a few remarks. They will be based on knowledge acquired during the course of various researches, and will refer to the losses sustained in the past of precious materials for the study of historical geography, and on the best measures for their discovery and preservation in future.

I need not dwell at any length on the importance of this branch of the science of geography, on the one hand, to the study of physiography, which is another branch of that science, and on the other to history.

Some knowledge of geography, or the advice of a geographer, is a necessity to a historian. I think that, amongst our great historians, Mr. Freeman was the most deeply impressed with this necessity. He felt the need not only of a general knowledge of geography, but especially of a knowledge of historical geography, of the physical changes in a region which are recorded in history. He was guided a good deal by a very eminent physiographer and geologist now living, and thus his descriptions of the scenes of great events were accurate as well as more graphic. His accounts, too, of the routes taken by armies owed their correctness to the study of historical geography; notably, the march of William the

* Contributed to Sub-section (*a*) of Section IX. of the International Congress of Historical Studies, 1913.

Conqueror from York to Chester Similar examples of the importance of historical geography to the historian might be multiplied almost to any extent. The battle of Sluys could not be understood, indeed, would be unintelligible, without a knowledge of the physical changes in that region; and for a comprehension of the siege of the same town of Sluys, nearly three centuries later, a geographer's knowledge is equally indispensable. How soon one detects the historian who has not visited the scenes he describes, and has overlooked the teachings of historical geography!

Seeing, then, the great value to the historian of the materials which it is the office of the historical geographer to place within his reach, we must be impressed with the importance of preserving those materials, and of diligently and systematically seeking them out, as well as with the disastrous consequences of the loss of so many precious journals and other documents. These losses, which have occurred in all countries, are most deplorable, and, it is to be feared, to a large extent irreparable. They constitute a blank, or rather several blanks, perhaps never to be filled up in the world's history.

I can only refer to those heavy losses which have come to my own knowledge, and over which I have had to mourn; but it is worth while to cast a glance over them. Doubtless other students know of many more.

Where, then, is the work of Nicholas of Lynn recording his discoveries? Chaucer has told us of the Oxford student's preparation for his great enterprise. We see him in the lodgings he hired from the carpenter and his young wife, with his Almagest of Ptolemy, his astrolabe and his angrim stones on a shelf at his bed-head. We are told how young Nicholas loved to deck his chamber with sweet herbs; how he made melody on his psaltery and sang the *Angelus ad virginem;* how he was well known for his courtesy; while we may look upon his love passage with the carpenter's wife, and his consequent trouble, as Chaucer's fun to make a good story. Next we hear of Nicholas as a Carmelite monk at Lynn, and as starting on an expedition of discovery in Norway and the Far North. He fixed his latitudes with that astrolabe which used to be on the shelf at his bed-head when he was a student at Oxford. He reported that there were islands round the pole. I believe that he must have discovered Spitsbergen. But the record is lost.

There certainly was a book, and its title was 'Inventio fortunata.' Gerard Mercator is quoted by Hakluyt as having seen it, and as stating that Nicholas of Lynn had travelled in Norway, and to islands in the Far North; that he described all these places, and determined their latitudes by an astrolabe. My friend Nansen is the first writer who has treated Nicholas of Lynn seriously. He shows that the work of Nicholas was known to Las Casas, and also to Martin Behaim, who, on his globe, places the islands round the pole, as described by Nicholas; Claudius Clavius and other mediæval cartographers were also indebted to our Oxford student.

Well, the book is lost to us. It could not have been in England three centuries ago, or Hakluyt would have been sure to have found it. There is evidence that copies were in existence in the Low Countries, in Germany, in Spain at that time. Surely we must not lose all hope of finding it some day. Until then the important story of the enterprise of Nicholas of Lynn is lost.

Next there was the voyage of discovery undertaken to find the fabled island of Brazil. We only hear of it in the chronicle of William of Worcester, who says that the expedition was commanded by one Thylde, the most scientific seaman in all England; that he went in search of the unknown land in July, 1480, and was absent sixty-four days. There must have been a journal; but it is lost.

The case of John Cabot and his lost journals is still more striking. We know that the famous navigator sailed from Bristol, re-discovered Newfoundland, and returned safely from his first voyage. But we only know it from the news letters of two Italians who happened to be in England; Cabot's own journal is lost to us. The second voyage of John Cabot was probably the most important, and of it we have no account whatever. Nansen is inclined to explain this by supposing that Cabot never returned. It may be so, but if he did return there must have been an account of the voyage. The loss of the journals both of the first and second voyage of John Cabot is very serious, and I fear that there is little or no hope of ever finding them.

The narrative of the important voyage of Button to Hudson's bay is also lost, and we should be left in total ignorance of it, if it had not been for the particulars given by Luke Fox in the introduction to his narrative.

These are only a few of the losses that historical geography has sustained in this country, just those which have affected me personally. In other countries quite as many losses have to be deplored. For instance, as regards the discovery of New Granada, the narrative of the Conqueror himself, by far the most important document on the subject, is lost. For the history of the Incas of Peru at least a dozen important works are lost, which are referred to by Blas Valera and Velasco. The dangers incurred by precious manuscripts are manifold. The Bishop of Palencia despatched the first expedition destined to make a voyage, by Magellan strait, to Peru. One ship safely reached Callao, and the journal was landed. It was entrusted to the old soldier-chronicler Cieza de Leon. He had it in his pocket when the two armies of La Gasca and Gonzalo Pizarro were facing each other. There was a rout of Pizarro's followers and some confusion. When evening closed in, the precious manuscript was no longer in his pocket. Thus the narrative of the first voyage from Europe to the west coast of South America was lost to us. The narrative of the first voyage from Chile to the Strait is also lost.

Turning to the Far East, we have to deplore the loss of one of the earliest narratives of a journey to the capital of Tibet. A Dutch traveller

named Van der Putte, in 1730, reached Lhasa and wrote a narrative. It is lost. All that remains of the results of his very remarkable journey is a small skeleton map in the museum at Middelburg. But the list of losses to historical geography is a very long one, and these few instances will suffice to show the need for the careful preservation of materials in the future, and for diligent searches to discover both what is known to have been lost, and what is still unknown.

There have been long periods of neglect, but at intervals men, to whom posterity owes a great debt, have arisen, who have been penetrated with the importance of preserving the record of historical events. It is to King Alfred that we owe the preservation of the accounts of the voyage of Other, and of the voyage of Wolfstan. Map-makers were diligent, throughout the middle ages, in collecting information. The labours of the editors of the thirty-three editions of Ptolemy during the renaissance, from 1472 to 1572, fill one with admiration. Then Richard Eden was the father of English historical geography. Coming up to London from Queen's College, Cambridge, the sight of the gorgeous public entry of England's Queen Mary with Philip, the King of the New World, nearly lifted the young student out of self command. He resolved on the spot to set about some work which might fitly commemorate such an event. To this we owe his 'Decades of the New World' of 1555, the little black-letter volume which Eden found such great difficulty in getting printed.

Eden was the forerunner of Richard Hakluyt, who devoted his whole life to the discovery and preservation of narratives and journals of enterprises by sea and land. He was an indefatigable labourer in this field of research, and thought nothing of riding several hundred miles on the chance of finding some old veteran who had been a member of an expedition of which he could find no account. He saved great numbers of documents from oblivion which are quite essential for the history of the early maritime enterprise of our country: and his principal navigations is a vast storehouse of information, and a monument to the indefatigable labours of this great benefactor to his country. The mantle of Hakluyt fell on a less able successor, and, invaluable as are the volumes of 'Purchas his Pilgrims,' we have to lament many injudicious curtailments and omissions, such as the log, and above all, the map drawn by Baffin of his discoveries. Its loss led to a series of cartographic blunders extending over two centuries. Englishmen were by no means alone in their efforts for the preservation of records. Peter Martyr and others laboured with the same objects in Spain, Ramusio in Italy, much good work was done in France, and later the voluminous collections of De Bry were published. In the eighteenth century, collections with the same laudable objects continued to appear in this country, Harris's voyages in 1705 and 1764, Astley's voyages in 1745, Churchill's collections, containing several hitherto unpublished narratives, in 1747, Pinkerton's voyages and travels in 1808, and Kerr's collections in 1815 to 1824. The admirable works of

Dalrymple, Burney and Hawksworth preserved and recorded the work of voyagers in the Pacific.

In Spain, during the latter years of the eighteenth century, Muñoz was preparing for a great work on the history of Spanish America, by having numerous documents transcribed, which were buried in the archives of Simancas and Seville. His invaluable collection is now accessible to students, in the library of the Academy of History, at Madrid.

In our own days there has been some activity. Hakluyt, Ramusio, and Muñoz have not been without representatives in these our days. The Hakluyt Society was founded in 1847, and has continued to flourish, producing new editions of scarce or inedited works, bringing valuable manuscripts to light, and zealously and successfully continuing the work of its great namesake. Quite recently the historical geographers of the Netherlands have founded a kindred institution with the name of the Linschoten Society. In Spain my lamented friend, Marcos Jimenes de la Espada, was for years very actively and diligently employed in discovering previously unknown historical documents of value, and editing them with rare discernment and ability.

In Portugal an institution has recently been formed, entitled the Portuguese Society of Historical Studies, and it already has as many as ninety members. It has a quarterly organ, entitled *Revista de Historia*, of which four numbers have already been published. They contain original articles, results of the exploration of archives, notes on local history, reviews, and short notices. The Torre do Tombo is an immense mine of materials connected with the subject of historical geography, which is still largely unexplored. The library at Evora, too, is rich in similar treasures, including important letters from the Amazonian missions. I may give one example of the possible interest that may result from searches in the Torre do Tombo at Lisbon. Dr. Nansen, in his great work, mentions a correspondence between King Frederick I. of Denmark and Affonso V. of Portugal, in which the latter is said to have urged his Danish Majesty to despatch an expedition to the north. Hitherto searches for this correspondence have been unsuccessful. Still it may be there. One excellent course that has been adopted in editing the *Revista de Historia* is to publish short documents which have some historical interest, but which are not sufficiently long for separate publication. Such documents may be found in the archives of the state, or in municipal archives, and are often both valuable and interesting. The Portuguese Society of Historical Studies has a directing Council, which is at present presided over by Prof. Silva Telles, the secretary of the Lisbon Geographical Society, who will be remembered at Cambridge as having represented his university at the Darwin centenary. The Society also has the advantage of the services of Senhor Fidelino de Figueredo, whose learning and enthusiasm are guided by organizing ability and common sense.

I have a duty, which to me is also a pleasure, in giving some account

of the objects of this useful Society in Portugal to those learned colleagues who are assembled in London, to discuss kindred subjects. I am sure you will all wish success to the young Society in Portugal, which I have the honour to represent at this Congress.

There can be no doubt that there can be no better way of securing our objects than through the instrumentality of such institutions as the Hakluyt Society, the Linschoten Society, the Bibliophil Societies in Spain, the Society of Historical Studies at Lisbon, and others. There should also be individual effort and individual research. There is still an immense field to work upon, and there is still danger of the loss of valuable documents through indifference or carelessness of those in charge.

For example, I may mention one or two things within my own experience. When the East India Company was abolished, waggon-loads of papers were carted away and sold as no longer of any use. I was walking down Leadenhall Street when I saw one of these laden waggons with papers fluttering away, and as it passed me a bit of stick dropped out. I picked it up and took it home. It turned out to be one-half of an exchequer tally recording a sum of money borrowed by Charles II. from the Company. It had never been repaid, or the other half would have been returned. Many years afterwards I gave it to Lord Curzon as a curiosity for the Victoria Museum at Calcutta.

Another example. I was in the tower at the present India Office. There was a damp sort of gutter, and an old parchment-covered manuscript had been thrown over it to prevent people from wetting their feet. I picked it up. It was the original journal of the Arctic voyage of Captain Knight in 1611. There is an abstract in 'Purchas,' but this was the full journal. I had it printed in one of the Hakluyt Society's volumes, so that it is now safe.

I mention these two examples of what has happened to show that valuable materials for the history of geography are even now not perfectly safe from destruction.

There are still great mines of unexplored materials even in this country, but more in Spain and Portugal, as well as in France, Italy, and Germany. Much has been discovered quite lately, but future searches must be equally diligent and intelligent, and must extend over a long time before the history of geography can approach completeness. New discoveries are, however, constantly being made. It was only in 1886 that the large map of Olaus Magnus (Venice, 1537) was discovered at Munich, and the Zamoiski map (1467) was found at Warsaw two years afterwards. There was one notable result, among others, from these discoveries. The notorious map of the Zeni had held its ground, owing to the argument that it contained many names which were found nowhere else. They were all on the Olaus Magnus and Zamoiski maps, or else in the map of the Donis edition of Ptolemy (Ulm, 1482). Thus fresh discoveries serve to correct errors as well as to yield additional information.

But we have much more recent examples of important discoveries which will shortly be given to the world under the auspices of the Hakluyt Society.

It may be remembered that Captain Cook was rather surprised at finding that other navigators, apparently Spaniards, had visited Tahiti shortly before his arrival. We shall soon know all about these visitors. Dr. Corney has discovered, among the archives at Seville, a complete account of an important expedition despatched by Don Manuel Amat, the Viceroy of Peru, with a narrative of the voyage.

Another most important discovery respecting the voyage of Sir Francis Drake has been made quite recently, which will throw a new light on the procedure and conduct of the great navigator. While making researches in Mexico on points relating to the antiquities of that country, Mrs. Zelia Nuttall came upon a letter having reference to Drake's voyage. This led her to turn her attention to searches in that direction. The result was that she discovered a number of letters and depositions, chiefly from Spanish prisoners, who had been detained on board Drake's ship. All were previously quite unknown. Mrs. Nuttall then turned her attention to the archives at Seville, where her diligence was again rewarded. This learned and accomplished lady will shortly be able to give to the world a whole volume of previously unknown material, all relating to Sir Francis Drake's famous voyage.

These examples are sufficient to show how much diligence is still needed, and how many important discoveries are still awaiting the laborious searches of future historical geographers. If, as is undoubtedly the case, there are still vast regions unknown and unsurveyed for future travellers to explore, there is quite as large an undiscovered region, in the buried archives of the past, for the historical explorer to unearth and make known to us.

THE MONTE BELLO ISLANDS.*

By P. D. MONTAGUE.

The Monte Bello islands are a small group lying off the north-west coast of Western Australia, in approximately lat. 20° 25′ S., long. 115° 33′ E., 105 miles E.N.E. of the North-West Cape, and 40 miles from the mouth of the Fortescue river, the nearest point on the mainland. The group is situated at the northern end of an extensive shoal, which stretches in a southerly direction to within 15 miles of the mouth of the Robe river, including Barrow, a large island lying 12 miles S. by S.W. of the Monte Bello group. The southern portion of this shallow area, known as Barrow Island shoals, gives soundings up to 2½ fathoms, and dries in patches at low water. It

* Royal Geographical Society, Afternoon Meeting, April 24, 1913. Map, p. 112.

covers over 100 square miles, and closely approaches another bank which lies between the mouths of the Cane and Robe rivers, and includes the Mary Anne islands. The passage between these two shoals is only 4 miles wide and nowhere more than 9 fathoms in depth, so that a land-connection of comparatively recent date between the mainland and the outermost islands is by no means improbable. The Monte Bello islands may have at one time formed the northern extremity of a cape, for to the west of the shoal soundings of 40 to 50 fathoms are struck almost immediately, whereas to the north-east the water deepens very gradually as far as a line drawn from Preston island to the north of the Monte Bello group, the depth in most places being under 10 fathoms. Further to the north-east the water deepens again somewhat rapidly.

Though zoologically this is a somewhat barren region, yet it is of great importance that the fauna of the small islands should be studied and recorded as soon as possible, for the indigenous animals are disappearing so rapidly before introduced species that in a very few years' time little or nothing will remain.

Mr. T. H. Haynes was for some time living on the Monte Bello islands, engaged in an attempt to cultivate pearl-oysters. He spent much of his spare time in collecting zoological specimens, some of which were sent to the West Australian and some to the British Museum. As some of these presented features of interest, Mr. Bernard Woodward, director of the West Australian Museum, considered it worth while that the group should be thoroughly investigated, and the trustees of that institution granted a sum for the purpose. This money being insufficient, application was made to the Royal Society, who granted a further sum, and the writer, accompanied by L. Burns, of Perth, Western Australia, as assistant, spent from May 29 to August 29, 1912, collecting the fauna of the group.

These islands appear to have been first discovered by Commodore Baudin, who was sent by the French Government to survey and report upon the coast of Western Australia with a view to colonization. He sailed up the north-west coast in about the year 1805, but discouraged by the seeming barrenness of the country, the scarcity of fresh water, and the hostility of the blacks, he kept to the sea, and did little else than survey the coast-line and islands. There is no evidence that this group has ever been inhabited by natives. This is probably due to the entire absence of surface water after a period of drought. After the rains, some of the rock-holes remain temporarily full, and water may be obtained by shallow digging in the sand in various places, but the supply soon fails. Permanent water may be obtained on Trimouille island by digging down about 5 feet at the foot of a very high sand-dune, while on Hermite island the only permanent source is a well sunk in the solid rock. The rains, which are very unreliable, fall during the summer, usually in January or February, and are often accompanied by a severe cyclone known locally as a "Willie-willie." These storms, which strike the

north-west Australian coast between lats. 18° and 23°, are of extreme violence, and cause great havoc to buildings and shipping. Around Onslow there may be seen lines of short iron telegraph poles, which have been bent near the middle through as much as 45°, affording ample testimony of the force the wind can attain. These cyclones may occur between November and March; from April to October, dry and comparatively calm weather can be depended upon. Occasionally there are slight showers in June or July, which are more frequent some distance off the coast. Hence the Monte Bello islands are favoured with a slightly higher rainfall than the mainland opposite. It is probably owing to this slightly higher rainfall that the vegetation on these islands is somewhat more dense and luxuriant than on the mainland. The plants are not so scattered, and appear to be generally less affected by arid conditions, and an acre on Hermite island supports as many species and individuals as could perhaps be found on 2 or 3 acres near the coast of the continent in the same latitude. The rainfall in this region averages 8 inches, but is most irregular. In some seasons, even for two or three in succession, practically no rain will fall, while in other years over 12 inches will come down in the course of a few hours.

The Monte Bello group measures about 11 miles from north to south, and consists of three main islands—Hermite, Trimouille, and North-West islands. There are, besides, numerous other rocks and islets, most of which are unnamed. The rock-formation throughout is of post-Tertiary limestone, comparatively poor in foraminifera, but containing many small fragments of broken shells. It is essentially similar to the limestone which extends intermittently down the greater length of the west of the continent as a coastal formation, and from which it has evidently been detached.

Hermite island is the largest; it is somewhat over 6 miles in length, and $1\frac{3}{4}$ broad at the widest point. An extensive shallow inlet known as the Large lagoon, nearly 3 miles long and averaging rather over half a mile in breadth, runs up the middle of the island in a northerly and southerly direction. The entrance to this inlet is on the eastern side and towards the south end, and is sheltered from the open sea by a long and narrow island, so the lagoon forms an admirable retreat for pearling-luggers during the cyclone season. Entering on the north-east of the island there is another large inlet, known as the Home lagoon, which almost joins the north end of the Large lagoon. Thus the island is divided into an eastern and a western portion, connected by a narrow rocky causeway, which at high spring tides is less than 20 yards across. Extensive areas of these lagoons dry to mud-flats at low water, and are drained by permanent tidal channels, much frequented by sharks and string-rays. There are, besides, several smaller inlets. The inner ends of these lagoons and sheltered bays along their sides are skirted with mangrove forest.

The general contour of the land is rather undulating, with low

but abrupt limestone hills rising from the more level "spinifex plains," bearing very scanty vegetation upon their steeper slopes. The highest point on Hermite island—in fact, the highest point in the group—is 180 feet above sea-level. The tops of these hills are very bare, with much of the rock-surface showing. Exposed rock on the hilltops is always covered by a thin but intensely hard surface formation, formed by the rapid evaporation from the surface drawing up water from the lower levels of the rock and depositing the dissolved mineral contents. This deposit is marble-like, reddish in colour, and never more than 3 inches in thickness.

An illustration of the movements of the water in the lower levels, due to varying degrees of evaporation from the surface, is afforded by the well on Hermite island. This well is about 15 feet deep, and has been cut in the solid rock at the base of a low hill on the south side of the Home lagoon. The level of the water in this well fluctuates; some days it runs quickly and furnishes a ready supply, while at other times it nearly dries up. A regular supply of about three gallons was taken daily, but this had very little effect, except when the water was very low, for it was replaced in the course of an hour or so, reaching again a particular level, which varies by itself from day to day and week to week. That a relation actually exists between the amount of water in the lower strata, as indicated by the level of the water in the well, and the rate at which evaporation from the surface is proceeding, is suggested by the following observations.

On June 11 to 12 the temperature was high, ranging from 85° to 90° F. in the shade between the hours of 10 a.m. and 3 p.m., and the evenings were warm. On the three days following—June 13 to 15—a very strong and dry east wind was blowing, which, though it dropped somewhat towards evening, blew fairly strongly throughout the night. The sky was absolutely clear, and the shade temperature averaged 80° throughout the middle of the day. On June 15 the well was almost dry. On the evening of the 16th the wind dropped and there was a heavy dew, whereupon the water began to flow again. Similarly, from June 21 to 29, a strong, dry, easterly wind was blowing almost continually, and though the shade temperature did not rise above 80°, the well was nearly dry again by the end of that period. From August 10 to 13, the same conditions prevailed, with identical results.

The coast-line is very rocky; running down the east side of the island are low perpendicular cliffs ranging from 30 to 60 feet in height, whereas on the more sheltered western side the hills often rise directly from an ill-defined rocky beach, and there are considerable stretches of sandy shore, bad to land upon in a boat owing to the frequency of sharp isolated rocks and boulders.

The margins of the "lagoons" are very characteristic. The low hills surrounding them descend to a flat and narrow rocky terrace, on which there is usually no vegetation, if it is washed by the seas at very high

tides in windy weather. Here the rock surface is cracked in every direction, and the interstices so formed are filled, or partially filled, with a kind of cement, formed from evaporated salt, and from limey exudations from the broken surfaces. The general appearance suggests a pavement of large and irregular flagstones. This terrace varies much in width, and is obliterated in places by sand which has been washed or blown upon it. It descends abruptly to the tidal flat, and the rocky walls thus formed, which range from 2 to 6 or 7 feet in height, according to the depth of sand which has accumulated beneath, are very much undercut, giving rise to the characteristic overhanging margins shown in the illustration. In the vicinity of mangroves the rock is often stained to a dark brick-red colour.

The skirting mangrove growth comprises two species, a pseudo-mangrove, *Avicennia officinalis*, belonging to the family Verbeneæ, which grows to a height of about 25 feet under favourable circumstances, and sends up short, erect aerial roots which thickly stud the ground beneath them. This species grows in the muddy sand right up to the rocky margin of the "lagoon," extending in a belt seldom more than 20 yards wide. The aerial roots attain their maximum development when the plant is growing at its lowest limit below high-water mark, and they vary from a couple of inches to over a foot in height. The latter figure is, however, unusual, and only occurs in one mangrove strip on the Large lagoon, where the trees are growing exceptionally far below high-tide level. Thus it would seem that the development of these organs bears a relation to length of time during which they are submerged, which is natural when the economy of the plant is considered. Within the Avicennia belt there grows a true mangrove of the genus Bruguiera, a shrub seldom attaining more than 7 feet in height. This forms an inner belt varying greatly in extent. The two zones form a sharp contrast, the one with its dull leaves and comparatively well-grown trees giving ample room to move about beneath them, the other, a dense tangle of twisted dropping roots and stems, with glossy, bright green foliage.

The vegetation covering Hermite island is of a type known as spinifex scrub. A species of spinifex is the predominant plant over the flatter and more fertile areas. It forms dense and rounded tufts with the bare sandy soil between them, leaving just room to avoid the intensely sharp leaves when walking over such country. Interspersed with the spinifex are various herbs and shrubs, of which especially noticeable are a cassia and a thin and wiry composite bush attaining a height of 7 or 8 feet. Along the sandhills by the shore there grows a large twisting bush, known to North-West Australians as "snake-wood," which furnishes good firewood. Many of these bushes have had their foliage burned off them by the pearlers, so that they may dry thoroughly and furnish fuel for future "lay-up" seasons.

Of next importance comes Trimouille, the largest of a chain of islands and rocks running in a line approximately north-west and south-east, and

forming the north-west boundary of the group. It measures rather over 3 miles in length, and is nowhere a mile in width. The greater part of this island is covered with blown sand, which at the extreme south-east end is very coarse, almost gravel, whereas at the opposite extremity it is of much finer texture. Towards the north-west end there are two large and conspicuous white sand-dunes, about 150 feet in height, at the foot of which water may be obtained by digging to a depth of 5 or 6 feet. It was here that a certain Mr. Louis Williams, locally known as "Balmy Louis," took up his abode for several years, hunting Hawksbill turtle, which formerly came up on to the beaches to breed in considerable numbers, though now they are nearly extinct in that neighbourhood. Here the sandy shores are very extensive, and continuous along a considerable stretch of the south-west coast. On the opposite side the cliffs are fairly high, but expanses of sandy beach lie beneath them for the greater part of their extent. In many places the dunes come right down to the sea, and these are the great breeding localities for the turtle. Around the south-east end of the island the sea is very shallow, and large areas of sand are exposed at low water.

There is but one lagoon on Trimouille, and this is quite different in character from those of Hermite island. The entrance is situated near the north-west end of the island; the inlet itself is very shallow, but there is no rocky margin, the shores of white sand rising directly to the dunes. On one side the shore is flat, and traversed by a branching tidal creek, about which mangroves grow, though the bushes are somewhat scattered and stunted. At the dryer extremity is an area covered with well-grown Avicennia, with dense masses of the Brugneira in the wetter places, here and there forming an undergrowth. This particular mangrove creek is the headquarters of a small bird, *Zonæginthus castanotis roebucki*, which, as far as the Monte Bello islands is concerned, is confined to Trimouille. It agrees with specimens from Roebuck bay, and is a sub-species of a bird widely distributed on the mainland of Australia.

The vegetation on the sandy slopes surrounding this inlet is again somewhat peculiar, a notable feature being the predominance of several chænopodiaceous plants, both herbs and shrubs. One of the latter forms dense patches of considerable size, usually a short distance above the tide-level; it is very rough and coarse, with dull, spotted leaves, silvery on the under surface.

On the higher sandhills the most noticeable plants are spinifex, which grows thin and sparingly, a trailing leguminous plant, and the widely distributed *Ipomœa pes-capræ*. The latter has a trailing stem sometimes as much as 30 or 40 yards in length. The internodes are very long, there being sometimes as much as 20 feet between the short erect branches bearing the tufts of glossy green leaves and large pink flowers.

Of the other islands little need be said, for they embody to a greater or lesser extent characteristics already described. Some of the more outlying

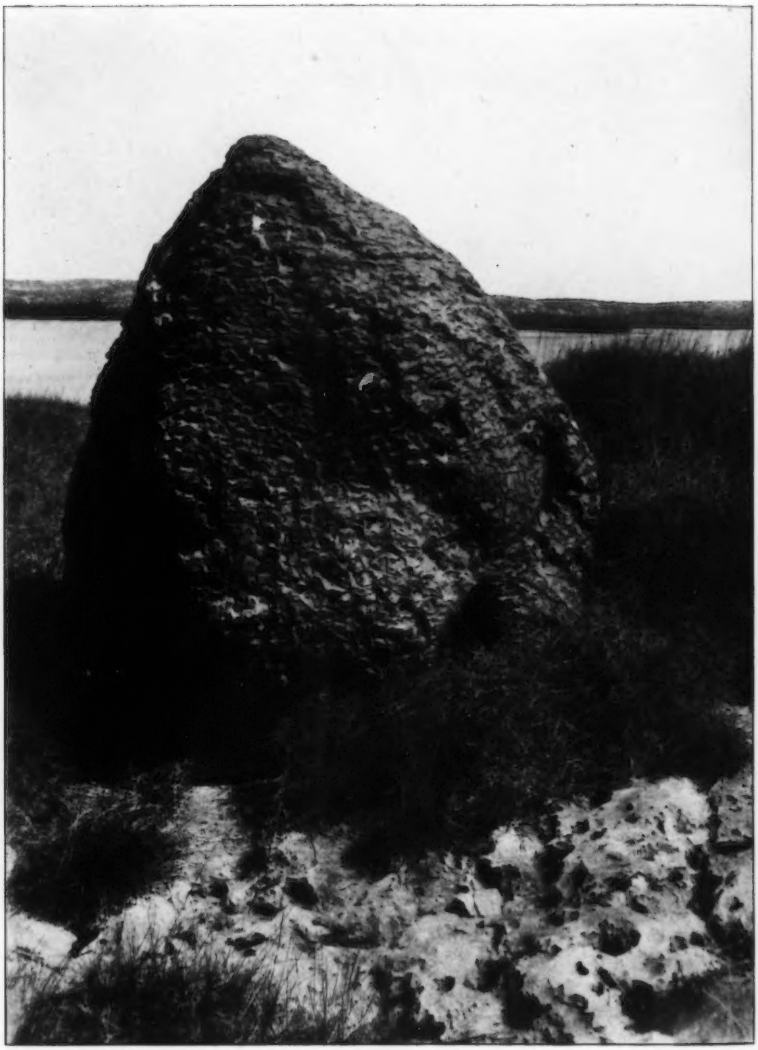
of them are inhabited during the nesting-season by colonies of "Mutton-birds" (*Puffinus tenuirostris*), which bred indiscriminately in holes in the rock or burrows in the sand. On these islands the vegetation is comparatively luxuriant—other conditions considered—owing to the extra fertility imparted by the guano.

As may have been judged from the foregoing remarks, the fauna is not large, though in many ways richer than might have been expected. Of mammals, the only remaining indigenous species are a small bat and a wallaby. This latter animal, known as *Legorchestes conspicillatus*, is found commonly on the spinifex plains of Hermite island. It also occurs on Barrow, but on the mainland it is represented by a more slender and agile sub-species of a rufous colour. The island species is about the colour and size of a large rabbit. It hops rather awkwardly, and if pursued on foot may often be captured, for though it can move fast at the start when put out of the spinifex, it very soon gets tired and slackens its pace so much as to be readily overtaken in the course of three or four hundred yards. It is nocturnal, and feeds upon the young shoots and bark of various herbs and shrubs. A bag of damaged rice, left by the pearlers near their last season's encampment, was visited almost nightly by these animals.

Domestic cats have most unfortunately been introduced, which do much damage amongst the wallabies, and have exterminated a bandicoot (*P. barrowensis*), which, as its name implies, occurs also—or did occur—on Barrow island. Bones were obtained, but no living specimen seen. The cats thrive exceedingly wherever they are introduced, growing to a great size. They soon become wild and cunning, and breed fast. It may be safely said that these animals are doing more damage than anything else to the native fauna of the Australian region; indeed, the same remarks apply to the greater part of the world. Cats are carried almost universally on small trading ships, with the idea that they keep down the rats. When they become too numerous or otherwise objectionable, they are simply marooned, for to kill a cat is considered amongst the sailors as most unlucky.

The black rat (*M. rattus*) is another introduced species which does great harm. All the specimens of this animal obtained were fine examples of the typical black form, not the brownish, pale-bellied var. *Alexandrinus* which is usually met with on islands. The animal is found universally over the Monte Bello group, even on the small outlying islets which are never visited, on which it occurs most abundantly. Its presence is attributed to a schooner which was wrecked some twelve years ago, for it is well known that this rat is a good swimmer. It is curious to find that this animal, which is now so rare in its native countries as to be looked upon as a great curiosity, should usually be one of the first species to populate new lands where it is comparatively free from competition. Driven from all civilized countries by the brown rat, it has taken to the

YOUNG AVICENNIA TREES, HOME LAGOON.



TERMITES' NEST.

sea, being better adapted for a life on board ship than its otherwise victorious rival.

There are ten small land birds, the majority of which agree with types from the north-west of the mainland, but two are sub-species not elsewhere recorded. One is a very pale form of *Anthus australis*, a species occurring in one form or another over practically the whole continent. The Monte Bello examples are the palest known, and the sub-species has been named *A. australis montebelli*. The second is a small dark sub-species of the uncommon *Eremiornis carteri*, occurring in the vicinity of the north-west cape. This bird has been named *E. carteri assimilis*.

Of the birds of prey, the western white-headed Osprey is by far the most abundant, and was found nesting on nearly all the small flat rocks and islands over the northern portion of the group. The nest, which varies very greatly in size, sometimes attaining 5 feet in height and over a yard in diameter, forms a very conspicuous object.

Two pairs of sea-eagles (*Haliastur leucogaster*) were found nesting, and a few pairs of *Haliætus girrenera*, so nearly related to the "Brahminy kite" of India, Ceylon, and Burma. On the Monte Bello island his species appears to feed very largely on rock-crabs, for on Trimouille a bird was observed to fly from a heap of the empty carapaces and broken limbs which formed a pile more than a yard across on a raised slab of rock in a shallow cave under a sea-cliff on the south-east side of the island. Similar remains were found in a nest which was subsequently discovered in the mangroves on Hermite island, and the birds were never observed to feed upon anything else.

The mangroves are much frequented by brown honey-eaters, and a species of ground-dove, which roost in the thick trees during the night and the heat of the day, and build their light stick nests among the branches. The nesting season varies according to the rains; it is said usually to be in January or February, but after a shower of rain in July, a small percentage of these birds began breeding.

Of the eleven reptiles, one, a *Typhlops* or burrowing snake, proved to be a new species, most nearly allied to the common Indian *T. Brahminis*. The lizards comprise Geckos, Scincs, Agamids, and Varanids, and the island specimens are generally very much smaller than the mainland examples, though otherwise inseparable. On several of the islands the ground is riddled with the flattened burrows of the big *Varanus Gouldii*, which often reaches 5 feet in length, and presents a somewhat alarming appearance when seen for the first time at close quarters.

In the shallow surrounding seas the green turtle is very abundant. A few remarks upon the breeding of this species may not be out of place, for in certain respects the habits appear to differ on opposite sides of the Indian ocean. I am told by Mr. J. C. Fryer that on Aldabra a nest is scooped out in the sand a short distance above high-water mark, and that when the young hatch they make straight for the water, following in a

line one behind the other. On the Monte Bello islands, though the "nest" is most often just above the tide-level, it is not infrequently a considerable distance inland amongst the sand-dunes, where in places the ground is littered with the remains of large individuals which have died before they were able to return to the water. Though no eggs were observed actually hatching, it being somewhat late in the season, yet numbers of nests were examined in which there were newly hatched egg-shells, with the tracks of young turtles radiating from them in every direction in a most irregular manner. Some of these tracks led straight away from the water and crossed and wound about in a most futile way, often terminating with the little dried body of their perpetrator. If such a condition is general, comparatively few of the young reptiles can ever reach the water in safety.

Insects were not numerous, owing to the barren and dry conditions, but it is hoped that the collections obtained may yield some interesting results. Orthoptera are well represented, and there are a fair number of Hymenoptera, especially Mutillids. A mound-building termite, in all probability undescribed, is very abundant. The regular loaf-shaped mud nests average about 5 feet in height, and the galleries are filled with chopped spinifex, probably forming a medium for the growth of moulds upon which these termites are said to live.

The fauna bears more close resemblance to that of Barrow island than it does to the corresponding forms occurring on the mainland. It will be seen that the two indigenous land-mammals *Isoodon barrowensis* and *Lagorchestes conspicillatis* belong both to this island and to the Monte Bello group, occurring nowhere else. Theoretically, this might have been anticipated, for there is no deep water between Barrow and Hermite island, whereas both are separated from the mainland by the Mary Ann passage mentioned at the beginning of this paper. This case bears out well the generalization that depth of the water between two land-masses is a far more reliable indication of zoological isolation than the distance separating them.

As previously mentioned, the Monte Bello islands have for some years been much resorted to by the pearling fleets. Owing to the very suitable nature of the sheltered tideways between the rocks and islands, perhaps also to the limestone formation, finer shell were formerly taken from this vicinity than from anywhere else off the North-West Australian coast, and examples up to 14 lbs. in weight were not uncommon. In the early days of the Australian fisheries "dry-shelling" was the only method resorted to for obtaining pearl-oysters; the sandy "reefs" were worked at low spring tides, and furnished an abundant supply. These soon became exhausted, but shell were still to be obtained by shallow diving, for which purpose the aborigines—"Bingies," as they were termed—were largely employed. This resulted in the depletion of the pearling-grounds down to a depth of 3 or 4 fathoms. Now the industry is carried on with well-equipped luggers with diving apparatus; Japanese and Malay divers are employed, who are skilful and economical, having remarkably little regard

for their personal safety. With the present price of shell at £350 per ton, they get a high commission on what they bring up, so that their one idea is to get the maximum amount in the shortest time, and a man who does not get his three tons per annum is stamped as a "saucepan diver" by the rest of the fraternity. Consequently they never go down or come up by stages, and a compression-chamber is unknown. A man who has been working for perhaps twenty-five minutes in 9 or 10 fathoms opens a valve in his helmet and inflates the dress, whereat he ascends like a bubble to the surface. In deep water a man can only work in a straight line, aided by a strong tide, and the lugger with the lines and pump is allowed to drift above him.

As might be anticipated, the life of a diver is not a long one; death frequently results from stoppage of the capillaries by bubbles of nitrogen, and partial or general paralysis is by no means uncommon. Another frequent malady, known among the pearlers as "half-caste," is apparently caused by increased pressure in the alimentary canal or body-cavity after a prolonged spell in deep water, causing a kind of rupture upon coming quickly to the surface.

Though the deep-water grounds are extensive, yet they have now become so depleted that it is only the abnormally high price of shell that enables them to be worked profitably. Various individuals have therefore turned their attention to the artificial culture of this mollusc. The great difficulty lies in the fact that in this species there is a comparatively prolonged free-swimming larval stage, which makes the adequate enclosing and protection of the young forms a matter not easily dealt with. One of the most scientific attempts was made by Mr. T. H. Haynes on the Monte Bello islands. The conditions there are favourable for experimenting, as there is about 12 feet of tide and in all probability an abundant food-supply. An enclosure of about an acre in extent was made on the north-west side of Campbell island by the adaptation and enlargement of a natural inlet. This was closed by a masonry dam with flood-gates, and water filtered out through the porous rock bottom to the extent of 2 to 4 feet, which was replenished at the flood. The willie-willie of 1909, however, completely destroyed Mr. Haynes' house on Hermite island and damaged his enclosure, bringing the experiments to an untimely conclusion.

When Hawksbill turtle were abundant on the islands in the north of the group, Malays were stationed on the various islands to watch the sandy shores during the breeding season, and an attempt was also made by a storekeeper at Onslow to ship green turtle, alive or canned, and a small canning factory was established. This however came to nothing, and the project proved a financial failure.

Apart from these natural resources already mentioned, now almost exhausted, there is little to recommend the Monte Bello islands to the settler, unless it were for a sheep station; but the scarcity of water after a period of drought will always prove a severe obstacle to further development.

Dr. UNSTEAD drew attention to Breakins reef, which lies off the group to west, north, and north-east, and asked what was its nature, if not a coral reef.

Mr. MONTAGUE: It is the limit of a shallow bank of which the Monte Bello islands form, as it were, the summit. Outside Breakins reef the water deepens somewhat rapidly to 40 or 50 fathoms. There is a certain amount of coral growing upon it, but scattered and in isolated patches. It is mostly sand.

Mr. OGILVIE suggested that the "lagoons" were really valleys which had filled up owing to subsidence.

Mr. MONTAGUE thought that there was nothing to indicate subsidence, and attributed the lagoons to the gradual encroachment of the sea into the lowlying parts between the limestone ridges.

A Member drew attention to the fact that the margin of the lagoons was very much undercut, while the shores facing the open sea were rough and rocky, and showed no such erosion. Mr. MONTAGUE attributed this to the swift-flowing tides which run up the long inlets, and the absence of big seas in these inlets, which would tend to break up any such configuration in an unsheltered position.

NOTES ON MOZAMBIQUE EXPLORATION.*

By R. L. REID.

THE area which these notes are intended shortly to describe was the concession known as Memba Minerals, Ltd., and is shown on the accompanying map. I am indebted to the directors for permission to reproduce the same and to give the following particulars.

The concession was taken up from the Portuguese Government for the purpose of mineral research, and a company being formed, a party of mining engineers and prospectors under Mr. E. W. E. Barton was sent out to commence operations in 1910. They investigated the coast belt, and for some distance westerly along the Lurio river, but were generally unable to penetrate far inland, on account of the hostility shown by the natives, and by difficulties of transport; one of the engineers (Mr. Vaux), however, travelling along the line of communication opened up by the Portuguese, reached a point, a considerable distance west, and it was decided that future operations should have their base at this point.

In the beginning of 1911, a fresh party was organized under the direction of Mr. Barton, the writer being one of the engineers, and it is with this later expedition the present sketch deals. Here I wish to record my indebtedness to Mr. Barton and the several members of the expedition who furnished me with sketches, notes, etc.

A great part of the exploratory work fell on Mr. Cooper who, accompanied by Mr. Wray, penetrated to the farthest west point reached; they also worked up to the Lurio river at several points; all their traverses being paced for distance, give their routes a good value. Mr. Barton, accompanied by Mr. Holmes, did most of the work along the southern

* Map, p. 112.

boundary, while Messrs. Wilson, Wayland, Starey, and myself, were employed in the more central portions. Each member was provided with a prismatic compass and recorded his routes, which were eventually fitted to a central line of stations laid down by myself from the coast to Sawa Camp; the instruments used being a 5-inch theodolite fitted with Reeves' micrometers to both circles, two watches, R.G.S. pattern, boiling point, and aneroid barometers. North and south stars and the sun were used to obtain latitudes, while longitude was determined by differences of time, observing to east and west stars, Fort St. Sebastian being taken as a starting-point on the coast.

Our headquarters were situated in the ancient town of Mosuril, where we were established in a fine old stone house said to be some two hundred years old.

Mosuril is on the mainland, some seven miles to the westward of the island of Mozambique, and is the headquarters of the Commandant or Capitao Mor of the district. Mozambique island itself is of great interest, being one of the oldest settlements on the coast of Africa, and is guarded by the fort of San Sebastian, built by Vasco da Gama. The fortress is still in excellent preservation. The Governor of Mozambique has his headquarters here. The Eastern Telegraph Company is represented by a staff of some fifteen officials, there is a military hospital, a cathedral, and a couple of European business houses. The town, however, is mostly in the hands of Indian and Goanese traders, and the population principally Indians and natives. Mosuril, also a very old settlement, contains some interesting ancient houses, but is in a state of ruin; a few Indian traders have stores here, but the remains of old walls and tanks, partly hidden by the dense vegetation and grasses, testify to a once populous centre. Mosuril is connected with the island of Mozambique by wire, and a telephone service extends inland to Nampula, and also along the coast, and to some of the outlying military forts in the interior.

The coastline, within the boundaries of the concession, contains three good harbours, one of which, Fernao Vellosa bay, is, perhaps, the best, after Delagoa bay, on the east coast of Africa. Pearls are found along the coast, and they can occasionally be obtained from the natives. Mounts Meza and Pao are notable landmarks lying inland, and are plainly visible from the harbour of Mozambique, but with these exceptions, the coast-line is lowlying, flat, and sandy, with scanty vegetation. Coconuts, however, thrive well, and no doubt with energetic cultivation could be made to yield a good output for export; but the Portuguese system of "Manana" condemns all industry to decay, and coconut plantations, as well as the pearl, timber, and grain trades, are falling back gradually into Indian hands, and those of the half-breeds and coast natives, under whom it will never improve. The lands of the interior are for the most part exceedingly fertile, and yield large crops of native produce; manioc, Kaffir corn, maize, sweet potatoes, ground nuts, beans

and peas of several kinds are obtainable everywhere. At Nampula, Ribawe, and our own base camp, European vegetables of the kind usually planted in temperate and semi-tropical climates thrive well.

No attempt has ever been made to exploit these regions by the holders of the country, and with the exception of our own investigations and the work of the Witwatersrand Native Labour Association, shortly called the W.N.L.A., little is known of its features and capabilities; it remains practically the same as when Vasco da Gama built his fortress of San Sebastian. True, lines of communication, by isolated stations, exist westwards, some 200 to 300 miles, and along the coast, but a few miles on either side of these, the country is practically unknown, and in the hands of natives, who object strongly to their Portuguese suzerains making any further investigations; and provided the tribes along these routes bring in their yearly tax to the stations, no further exploration is attempted. This is not the case with regard to the W.N.L.A. Their organization, formed to supply native labour to the Transvaal mines, has its agents well distributed throughout the territory. These gentlemen, men of the best type, have the entire confidence of the natives, and can move about amongst them over tracks never travelled by the Portuguese, and we found, when the natives realized we were English, they allowed us the same facilities. With one exception, a block of country ruled over by a powerful hostile chief named Nampowa, we were able to conduct our investigations with the assistance and goodwill of the native population in every part traversed.

The influence of the returned labourers from the Rand, among their brethren and the hostile tribes, must tend to civilize and pacify the whole country in time, but it is questionable if their contact with the British in Johannesburg gives these labourers a better feeling towards their Portuguese rulers. The native who returns from the mines is not the simple savage he was before his experience abroad. He makes comparisons, and part of his fresh acquirements may be the knowledge of his own power and when one reflects that the country is held by a few white officers with a mere handful of imperfectly trained and badly armed native troops, the possibility of a native rising becomes a serious question. These native tribes are not split up so much as in most parts of Africa, but are under big native chiefs, who with their headmen, have considerable authority, and can command large followings of young men, most of whom are armed with flintlock guns in addition to the usual lance. While I was at Nampula, a friendly native chief visited the commandent stationed there. This man, Makwapera, was accompanied by at least four or five hundred men, most of whom were armed with guns. Makwapera has long been an ally of the Portuguese, and has in the past assisted them in their native wars, but there are other chiefs quite as powerful who are by no means so favourably inclined towards their rulers, and a single reverse might convert the above chief into a hostile factor.

The territory as a whole is unhealthy, and the sanitary conditions in Mozambique and Mosuril are vile. The natives suffer much from leprosy and venereal diseases; this is specially noticeable on the coastal belt, but is not unknown in the interior, while in one or two places we noted entire villages had been deserted—from native description, I should say through the ravages of small-pox. Bands of lepers walk about Mosuril and the neighbouring native villages soliciting alms. Sleeping sickness seems unknown as yet, but we crossed two or three belts of tsetse fly (*G. morsitans*) in the interior.

The natural features of the land are very similar to a large proportion of the usual African country, that is, a low coastal belt rising in fairly well defined steps to the interior. Our concession was drained by three main rivers, the Lurio, the Mukuburi, and the Monapo, all running a general east and west course, and having their heads far back in the high ranges of the interior; the Lurio is much the most important of the three. These rivers have channels generally wide and shallow near their mouths, filled with gravels and sands, and run almost dry during the summer. The Monapo ceases running entirely for some of the dry months, but is marked by chains of waterholes which swell into a large river during the rains.

Few large tributaries come into these streams in their middle or lower courses, but the heads are fed by large and rapid mountain torrents of icy cold water, the amount discharged by these seeming much greater than the main rivers carry to the sea, no doubt lost partly by evaporation, but mainly in the beds of gravel and sand, with which the lower channels are filled. During the dry season most of the water used on the coastal belt is obtained by digging and is of bad quality, requiring boiling and filtering for European use.

With the exception of Mount Meza, Mount Pao, and a few granitic bosses about the mouths of the Mukubure and Lurio rivers, the coastal belt, and for some 30 or 40 miles inland, is unmarked by mountain ranges. Then isolated bosses of granite become frequent, and about Nampula merge into massive ranges showing the rounded top appearance which is characteristic of the territory. The heights also become much greater, and round Ribawe and Sawa rise to over 4000 feet. Most of the knobs and peaks have a grooved or scored appearance, which O'Neill attributed to glacial action, but which I judge to be merely weathering through rain and atmospheric agency.

The coastal belt is clothed with a thorn bush vegetation, in some places thick and troublesome to make a way through, opening out to light forest with sparse grass land as one progresses inland, the size of the trees increasing and the undergrowth becoming more open as one reaches the highlands of the interior. Among the useful trees were noted ebony, which has been much thinned out by the Indian traders, a tree like mahogany used for boat and house building, and a very durable wood

called m'krus. Trees yielding a latex are abundant about the Monapo. I am doubtful if this is real rubber, but a wiry vine exists from which the natives collect a small amount which they make up into balls, about the size of an apple, and sell to the Indian traders. The baobab extends inland from the coast some 30 to 40 miles, and the cashew and mango grow luxuriantly; some of the latter are of great age and immense size. Good oranges grow at Mosuril, and the natives cultivate plantains and a small sweet banana. Game is thinly distributed throughout, but is rapidly being exterminated by the natives, who harry the animals continually with guns and nets. Probably in another ten years the game will be completely gone.

Among the varieties seen were reed and bush buck, eland, waterbuck, greater kudu, Lichtenstein's hartebeeste, sable, and pig. Guinea-fowl, both crested and helmeted varieties, pigeons, and francolin are fairly plentiful, and form a welcome change from tinned meats. The usual African pests are also found in the shape of snakes and scorpions, while mosquitoes are in their millions along the coast and the watercourses during the rainy season. Tsetse fly was noted in several places west of Nampula, and was specially thick over a belt of about 3 miles at Potela Mazi, where big game was most plentiful.

A military road is kept open from Mosuril to Sawa, along which stores and mails are carried to the isolated Portuguese posts. The stages average about 15 miles, and the marching is good. Outside the military roads, native tracks connect the different villages of the interior, fairly good underfoot, but needlessly long, like all native African paths, passing round every small obstruction, winding away from the proper direction, in fact, following the footsteps of the first man who found his way through the bush from one point to another. The natives of the country are Makua, passing into Lomwe and then Yao as one travels west.

The country is thickly populated, labourers and porters easy to obtain, and their services entirely voluntary. Payments are made at the rate of about 150 reis per day on the coast, while in the interior, natives will work for half that sum, in each case food money is given in addition, about 50 reis per day. (£1 sterling is exchanged at about 4800 reis.) Payments are made either in money or in the equivalent quantity of cloth, blue sheeting (kaniki) being preferred. The natives are excellent workers, and will carry about 60-lb. loads for a 15-mile journey without a murmur. They are dirtier in their persons than the usual run of African native, and disgusting feeders, often never troubling to cook their food, but eating both manioc and flesh raw. There is a good sprinkling of Arab blood among the coast natives, and Swahili is understood, but the language spoken is Makua, and differs considerably from the Lomwe of the interior.

We found O'Neill's routes and descriptions as published by the Society in 1882, 1884, and 1885, of great use, and the positions correct, if one

allows for the constant shifting of native villages, and the accompanying map is not put forward altogether as pioneer work, but rather as extending the information, and showing the conditions at the present time which O'Neill's remarkable journeys gave us as far back as 1882.

THE CANADIAN ARCTIC EXPEDITION.*

By VILHJÁLMUR STEFÁNSSON.

It seems to have been fairly well settled that there is a single Antarctic continent, and no discoveries of new lands of considerable size are therefore to be expected in the south polar regions. The one place upon the surface of the whole Earth where the discovery of new land is possible is therefore in the unexplored section of the Arctic sea lying west of the Parry archipelago, north of western America and north of eastern Asia. It is the main purpose of the Canadian Arctic Expedition of 1913 to explore as large a section as possible of this vast stretch, the size of which, when shown by a glance at the accompanying map, is likely to surprise all but a few geographic specialists.

The question of whether this unknown area has within it undiscovered land of considerable size, is of course the most interesting of the many problems which the projected expedition will clear up, if it should prove as successful as it conceivably may. There is much theorizing on this subject. The chief spokesmen on the one side being Nansen, and on the other Peary, Greely and Harris. Nansen believes that most of the unexplored area is occupied by a deep polar basin analogous to that shown by his own soundings on the *Fram* Expedition, and those of Peary near the North Pole in 1909. On the other hand, Peary not only believes that he saw land to the north-westward from Cape Thomas Hubbard, but further inclines to the view that what he saw was likely but an outpost of a large land mass, the existence of which a study of the tides may lead one to infer.

The name, however, which is most frequently identified with this hypothetical land in the Beaufort sea is that of Dr. R. A. Harris, of the United States Coast and Geodetic Survey, whose main argument runs somewhat as follows:—

The situation of the Arctic sea with reference to the tide-making forces is such that the semi-daily tides in it are not generated there, but must come up either from the Atlantic or from the Pacific. They do not come from the Pacific, for Behring straits are so narrow and so shallow that as a matter of fact the tide from the south is neutralized by the tide from the opposite direction in the vicinity of Point Hope, Alaska or,

* Map, p. 112.

practically speaking, before it enters the Arctic ocean at all. The semi-daily tides of the north polar sea, therefore, are generated chiefly in the Atlantic, and sweep up north through the wide and deep opening between Norway and Greenland. If there were in existence no other lands than those which our Arctic charts show us, this tide should, it would seem, sweep unobstructed straight across the Pole and would strike the north coast of Alaska approximately at right angles. This, as a matter of fact, it does not do. Instead of coming at right angles from the north, the tide comes from the west, approximately parallel to the north coast of Alaska. This, so the argument runs, could happen only through the deflection of the tide by large mass of land, a dense archipelago, or shoals extending far westward from the known lands of the Parry archipelago.

Dr. Harris, on the basis of a detailed study of the tides, has plotted his hypothetical land so as to show an area of about 500,000 square miles, and so as to lie west of the known islands and separated from them by a narrow channel only. If the channel were wide, he argues, a portion of the tide from the Atlantic would come from the north along the west coast of Banks island until it meets and is neutralized by the tide coming from the west, but this, Dr. Harris considers, the tidal observations of M'Clure and others prove not to be the case.

If there were in the Arctic such a land as Harris has plotted, the Beaufort sea would be a body of water bounded by land on the north, east and south, but freely open to the west. If such were the case we would expect a westerly wind in the Beaufort sea to create a high storm tide and an easterly one to produce a correspondingly low tide. This is in fact true. My own observations show that whereas the semi-daily tide on the north coast of Alaska is generally less than a foot, the difference between high water as produced by a westerly and low water as produced by an easterly wind may reach in many cases quite six feet. A westerly wind causes a rise of water at every point on the north coast of Alaska from Icy cape east, as I know by personal observation, and the same holds true as far east as Dolphin and Union straits. On all the same stretch an easterly wind produces the reverse effect. At Herschel island the coming of a westerly wind can in some cases be predicted several hours in advance by the rise of the tide.

As has been said, the main object of the expedition is to explore the Beaufort sea, and if any land does lie in some such a position as that plotted by Dr. Harris, the Expedition should discover it, provided it meets with no misfortune. The vessel of the expedition is a barkantine rigged steam whaler of 247 tons net, called the *Karluk*. The crew will consist of fifteen men. The sailing master is Captain C. T. Padersen, who has had about twenty years' experience as a whaler and latterly as a master of whaling vessels in the Beaufort sea. The *Karluk* should sail from Esquimault, British Columbia, the first week in June, and in the ordinary course will reach Nome the first week in July, where she will

take on coal and certain additional provisions before proceeding into the Arctic. If it turns out to be a season of easterly winds there should be no trouble in rounding Point Barrow about the last of July and Herschel island, near the mouth of the Mackenzie, should be reached by August 10.

At this point the expedition will be divided. Certain members of the scientific staff aboard the small auxiliary schooner *Teddy Bear* will proceed east along the coast to some point near the south-west corner of Victoria island, where they will establish their winter quarters. The two main objects of this party will be the further study of the Eskimo of Victoria island, visited by the American Museum of Natural History and the Geological Survey of Canada Expedition of 1908–12. The second object will be the detailed study of the geology of the region, partly on account of the intrinsic importance of gaining knowledge of this sort, and also because the economic importance of the region has been foreshadowed by the discovery there, in various places, of copper by the above-mentioned expedition. Besides this, routine work in the various departments of science will be carried on—zoological, botanical, meteorological, tidal, etc. Of special interest will be the observation by current meters of the strong tidal current in Dolphin and Union straits, where, as we found in our previous expedition, the strength of the current prevents the formation of thick ice at any time in winter.

The *Karluk* (after the stores and men for the south-eastern base have been transferred to the *Teddy Bear*) should stand directly north from Herschell island, as far as possible into the Beaufort sea. Although exploring vessels proper have never been so far off shore in this vicinity, whaling vessels have been as far as 200 miles north (magnetic) from Herschel island without seeing a cake of ice; and in the fall of 1906 the steam whaler *Narwhal*, Captain George Seavitt, went up along the west coast of Banks island to Norway island, and thence to a point 200 miles (magnetic) north of Herschel island without seeing a cake of ice on the entire cruise.

If the summer of 1913 should turn out to be such another season as that of 1906, it is probable that the *Karluk* can sail as far north at least as 76° N. lat., unless indeed land, or ice imprisoned by land, should stop her. If the *Karluk* should reach the edge of the ice before land is discovered, she would attempt to follow it east in the direction of Prince Patrick island, with the hope of establishing a base at Land's End; but should the ice lie farther south than that, the base would have to be established on the west coast of Banks island.

All this is supposing that the summer of 1913 is a season of easterly winds. Should it be a season of westerly winds, ice difficulties will be encountered soon after rounding Point Hope. The summer of 1908 whaling vessels were unable to reach Point Barrow until the last week in August, and another week of westerly winds would have made entry into

the Beaufort sea impossible that year. This was, however, the most unfavourable ice year since 1889, when whalers first entered Beaufort sea. Should the *Karluk* be unable to round Point Barrow until the last part of August, it is probable that she would be forced to hug the mainland coast closely on the entire voyage east, even should she be fortunate enough to get through at all, and in that case she would have to try to work around by way of Cape Bathurst and Cape Kellett, as far up the west coast of Banks island as possible.

It is the plan of the expedition to get men and supplies landed at as desirable a place as possible, and to send the *Karluk* back to the Pacific before the freeze-up, which in this part of the Arctic may be expected anything from September 1 to October 15. This will save the trouble of wintering a large number of idle men. To the scientific staff even the dark days of the sun's absence need not be tedious, for the time is now fortunately past when the Arctic explorer sat patiently in camp all winter, waiting for the warm sun of spring to bring him "weather suitable for sledging." According to modern ideas, every month of the winter (after the ice gets thick enough) is suitable for sledging, or, in fact, for almost any work that needs to be done, and the scientific man, therefore, has plenty to occupy him. It is not so with the sailor, who can but fold his hands and wait until the summer comes again, and who therefore finds the winter long and tedious.

While it is hoped that the *Karluk* may be able to return south, preparations will be made for her enforced wintering, and stores for three years will be carried, although we hope the vessel may be safe in the Pacific by the end of October, 1913. If she succeeds in returning south, she should come back again to visit us in the summer of 1914, and so on each summer until she finally brings the members of the scientific staff back in the fall of 1916, when their outlined work, if everything goes as well as possible, will have been completed.

Wherever the winter quarters happen to be, whether on some newly-discovered land, at Land's End, on Prince Patrick island, on Banks island, or even if it be through some misadventure on the mainland itself, sledge journeys will be made in winter across the sea-ice, not only with the hope of discovering new land, but for the purpose of taking soundings, in order to determine, if possible, the edge of the continental shelf and the character of the ocean bottom. It is of course impossible to tell how far from shore such a party may be able to go; it may be 5 miles or it may be 500, according to circumstances.

The scientific staff of the expedition will consist of two geologists, two topographers, two zoologists, one oceanographer, three anthropologists, a magnetic observer, and a surgeon. All these men will, of course, during the entire period of the expedition, do the work in their own departments, and they will do work in other departments also, as far as possible—botanical, entomological, and the like.

The ambition of the expedition is to become a comprehensively scientific one. It desires not only to discover new things, but also to study so well as opportunities allow any new thing that may be discovered, and to study also any old thing already discovered which has not as yet been sufficiently studied, and which falls in the way of the expedition in the discharge of its ordinary work. Both in the Arctic and in the Pacific special attention will be given to oceanography, for which the vessel is fairly well equipped.

DR. DE FILIPPI'S SCIENTIFIC EXPEDITION TO KARAKORAM AND EASTERN TURKESTAN.

THIS expedition, which has already been announced (*Geographical Journal*, November, 1912, p. 559), is now completely organized. The equipment and provisions have been procured in London and will be shipped to India within the next few days. The scientific apparatus is being collected at Genoa, and will leave for Bombay with the expedition on an Italian liner on July 23.

The following eleven members will take part in the expedition:—

F. De Filippi, doctor, organizer and responsible leader.

Commander A. Alessio, R.I.N., Lecturer on Theoretical Geodesy in the University of Padua, second in command of the expedition; in charge of the geodetic-astronomical work and of pendulum and magnetic observations.

G. Abetti, Lecturer on Astrophysics in the University of Rome, Assistant Astronomer of the Observatory in the Collegio Romano, who is to assist Commander Alessio in his work, and who will undertake astrophysical researches.

O. Marinelli, Professor of Geography in the University of Florence, and G. Dainelli, Lecturer on Geology and Astronomy in the Geological Institute of the same university, will undertake the geological survey of the districts traversed by the expedition.

A. Amerio, Professor of Physics in the Technical Institute of Padua, Lecturer on Physics in the University and in the School of Practical Engineering, will undertake observations in solar radiation and atmospheric electricity.

Marchese N. Venturi Ginori will assist in the above researches, and will undertake studies in photometry. These last two members will also take charge of the meteorological station.

Lieut. C. Antilli, of the Military Photographic Department, will take charge of the photographical and tele-photographical work.

Mr. J. A. Spranger, B.A., Mechanical Science Tripos, Trinity College, Cambridge, will act as assistant topographer.

The Government of India will appoint an officer of the India Trigonometrical Survey to accompany the expedition and take part in the survey work.

Finally, the expedition has secured the services of Joseph Petigax, the well-known Alpine guide of Courmayeur, who accompanied the Duke of the Abruzzi in all his enterprises.

Professors Marinelli and Amerio and Mr. Spranger will only start from Italy in March, 1914, and will meet the rest of the party in the spring at Leh (Ladakh).

The Italian Government has given every possible assistance to the enterprise, by officially appointing the greater number of its members and by providing the necessary scientific apparatus.

The Government of India will give every support to the expedition. Besides the handsome contribution and the appointment of a Survey officer, it will grant special privileges regarding custom duties, etc.

The following is the list of subscribers up to this date (June, 1913):—

His Majesty the King of Italy, £400; The Government of India, £1000; The Royal Society, £25; The Royal Geographical Society, £100; Reale Accademia dei Lincei, £80; Società Italiana por il Progresso delle Scienze, £80; Reale Società Geografica, £80; Reale Commissione Geodetica Italiana, £40; Acc. Scient. Veneto-Trentino-Istriana, £4; Sir Hugh Bell, £100; Mr. G. Fenwick Owen, £25; Mr. A. FitzGerald, £1000; Major E. FitzGerald, £1000; Monsieur Ernest Solvay, £200; Senatore L. Beltrami, £20; Comm. Marco Besso, £20; "Corriere della Sera," £40; Dott. F. De Filippi, £2000; Comandante L. De Filippi, £200; Senatore L. Mangiagalli, £20; C. H. E. Maraini, Deputato, £200; Senatore G. B. Pirelli, £20; Senatore Marchese E. Ponti, £20; Comm. R. W. Spranger, £1000; Marchese Venturi Ginori, £80; Marchese R. Venturi Ginori, £120; Marchese N. Venturi Ginori, £400. Total, £8274.

THE TENTH INTERNATIONAL GEOGRAPHICAL CONGRESS.

By GEORGE G. CHISHOLM, M.A., B.Sc., Lecturer on Geography, Edinburgh University.

THE Tenth International Geographical Congress, after being first summoned for April, 1911, and then postponed to October of the same year, at last met in Rome from March 27 to April 3 this year. It was presided over by the Marquis Cappelli. The opening meeting was held in the Capitol, in the historic hall of the Orazi e Curiazi, in the presence of his Majesty the King of Italy. The members of the Congress were then welcomed by Signor Nathan, the chief magistrate of Rome, and afterwards by the President of the Congress, and the Hon. Signor Credaro, the minister of Public Instruction. Thanks having been returned on behalf of the members of the Congress by Professor Otto Nordenskjöld, the meeting then concluded.

The two postponements of the Congress undoubtedly had a prejudicial effect not only upon the number of members present, but also on the arrangement of the business. The total number of members and associates was about 400, or not much more than half of the number who met at the last International Congress at Geneva. As for the arrangement of the business, the organizers felt themselves

under the necessity of making arrangements for any papers being read that had been accepted for the Congress at any of its meetings. The result was that in many cases when members were called upon to read their papers they were found to be absent, and the papers accordingly were unread. In that way meetings that were expected to last perhaps for two or three hours found that their business was concluded in the course of little more than one hour. The small number of members attending the Congress naturally had a prejudicial effect also on the attendance at the sectional meetings.

The more important papers were read at general meetings mostly held in the morning. In one of those meetings Dr. L. Lóczy, of Budapest, gave an account of the labours that had been carried out by the Geographical Society of that city on Lake Balaton. These labours had been begun in 1891, and had been conducted throughout by Dr. Lóczy, who proposed the enterprise twenty years ago, and he now presented to the Congress the original text of the results published by the Society. The basin of the lake, which attains an average depth of only 10 feet with a maximum of 56 feet, and has a total area of about 232 square miles (600 square kilometres), may be compared to the Sea of Aral. In the neighbourhood of the lake one may recognize five different morphological types: (1) the worn-down massives of the "Balaton Felvidék" formed by sediments of various ages from the Upper Palæozoic to the Jurassic; (2) horizontal strata of the Neogene; (3) the bays of the great Hungarian plain along the Sio and in the Nagyberek reaching to Lake Balaton; (4) the picturesque groups of the basaltic volcanoes in the neighbourhood of the Bay of Tapolcra; and (5) the marshes of the Nagyberek, of Kisbalaton, and of the valley of the Zala in the immediate neighbourhood of Lake Balaton. Along with these may be ranged the plains on the plateau of the "Balaton Felvidék," where the wind produces, even at the present day, veritable stony deserts.

In an eloquent oration by Dr. C. Van Overbergh, of Brussels, an account was given of the work that had been done in that city with a view to laying a scientific basis for human geography. An essential part of that basis must be an adequate collection of facts with regard to the various human races, and a beginning had been made with the African races. The result was that a volume had been published forming a general repertory of human geography containing 400,000 items of information furnished by the collaboration of men of science in all parts of the world numbering at least 600. These facts were arranged in alphabetical order according to peoples, regions, authors, and the works carried out for social purposes.

Dr. O. J. Skattum, Vice-President of the Norwegian Society of Geography, then gave an account, illustrated by lantern slides, of the explorations carried out by Norway in the Spitsbergen archipelago.

At the conclusion of the first meeting the President announced that the reports furnished on the geographical work carried out in different countries since 1809 presented by M. Bertacchi for Italy; M. Grandidier for France; M. Mesplé for Algeria; M. Conrotte y Mendez for Spain; M. Vasconcellos for Portugal; Dr. Scott Keltie for England *; Dr. Marion I. Newbigin for Scotland; Dr. Skattum for Norway; Dr. Madsen for Denmark; Dr. Hahn for Germany; Professor Oberhummer for Austria; Count Teleki for Hungary; Mr. Bryant for the United States; Mr. Fourteau for Egypt; and Prof. Nordenskjöld for Sweden, would be inserted in the reports of the Congress.

At the second general sitting an account was given by Colonel Close, Director-General of the Ordnance Survey of the United Kingdom, of the progress that had been made with the map of the world on the scale of 1:1,000,000, the preparation of

* Compiled by Mr. O. J. R. Howarth.

which was one of the most important results of the Congress of Geneva. He reported that nine States had undertaken the production of sheets of the International Map in accordance with the resolutions of the official Conference held in London in November, 1909, namely Argentina, Chile, France, Great Britain, Hungary, Italy, Japan, Spain, and the United States, and preparation work was also reported by the delegates of Portugal and Sweden. The thanks of the Congress were voted to those States. Several specimens of maps prepared in different countries were exhibited. Considerable discussion followed, and in the end the motion of Prof. Penck that delegates of all countries interested in the International Map should hold a meeting during the currency of the Congress to consider the question further, was unanimously adopted. That meeting was held two days later and submitted to the Congress the following resolutions :—

(1) It is desirable that another official Conference should be held to consider questions affecting the International Map of the World on the scale of 1 : 1,000,000, in the capital of a State which has already undertaken the preparation of sheets of the Map; and it is thought that it would be convenient to all concerned if this capital were Paris.

(2) In view of the fact that the general principles governing the construction of the map are already settled and adopted, the new conference would be asked to consider questions of detail only, such as the size of the lettering, character of railways, etc.

(3) It is desirable that all civilized states should be invited to send delegates to the proposed conference.

(4) It would be convenient if the date of the proposed conference were towards the end of the year.

(5) London (Geographical Section of the General Staff, War Office) remains the official centre of the undertaking until the Assembly of the proposed Conference, and communications of interest with regard to the International Map should be addressed to that office. Also, it is desirable that a set of not less than 50 copies of a selected sheet already printed should be sent by each country which has produced sheet or sheets to the above office, at an early date. These sheets will be distributed to the Governments invited to the new Conference, and to recognized private authorities.

At the final meeting of the Congress these results were confirmed. M. Ch. Lallemand then followed with a paper upon the new international map of the world on the scale of 1 : 200,000 designed to serve the purpose of aviators.

At the next general meeting Prof. Émile Chaix, of Geneva, gave an account of the state of progress of the atlas to illustrate the forms of terrestrial relief, which was also being carried out in accordance with a resolution of the Ninth International Congress. Prof. Chaix stated the causes that had so far delayed the progress of the work, amongst which was the fact that two of the members of the executive committee appointed at Geneva to carry out the work, himself and Professor Emmanuel de Martonne, had taken part in the Transcontinental journey across the United States last year, an opportunity for providing material for the atlas which was obviously not to be missed. Prof Chaix mentioned, however, that the committee had arrived at a systematic plan for carrying out the work, had succeeded in finding a publisher, and also in obtaining pecuniary aid which greatly facilitated the labours of preparation, and that, as is well known to geographers, a specimen number had been published and distributed among scientific bodies. In consequence of that there had been many requests to publish the work not merely in French but also in English and German. The consideration of this question required a good deal of time, and the committee, recognising the almost insurmountable difficulty of

preparing three different editions, had decided that each plate of the atlas should have the explanations of the author *in extenso* and a summary more or less complete in French, German, and English, eventually also in Italian. This would have the obvious advantage of providing the synonyms in those languages for all the terrestrial forms represented. Prof. Chaix was glad to be able to announce that for this work he had been able to secure the services of Dr. A. Rühl, of the University of Berlin, for the German language; Mr. A. G. Ogilvie, of the University of Oxford, for the English part of the work, and Professors Marinelli and Calciati for the Italian. He was at the same time able to announce that the committee could rely on publishing the first part, Ia, in the first days of November, and that by the end of 1914 the subscribers would have in their hands the whole of the first series of from 45 to 47 plates.

At the conclusion of Prof. Chaix's statement the following order of the day was moved by General Schokalsky :—"The Tenth International Geographical Congress approves of the plan adopted for the carrying out of the project of the atlas, of the forms of terrestrial relief and the execution of the work so far as it is yet done. It strongly recommends all geographers and all scientific institutions to aid this enterprise in every possible manner." The resolution was unanimously adopted, and was confirmed at the final meeting of the Congress.

Prof. Oberhummer of the University of Vienna then proceeded to read his paper on the re-issue of old maps. He pointed out that a systematic collection of ancient and medieval maps and maps of the period of the Renaissance faithfully reproduced from the originals would be of great service to students of geography. It was true that there were already collections of maps such as those of Jomard, Santarem, Fischer, Nordenskjöld and others, but they were not sufficient for the purpose, because they did not meet all the requirements of students, having been published in part at a time when the technique of photography and the graphic arts had not attained their present perfection. He recognized the admirable work that had already been done in this respect also by private associations such as the English Hakluyt Society, the Dutch Linschoten Society, the Hispano-American Society of Washington and others, but their work needed to be completed.

At an afternoon meeting General Schokalsky gave an account of the work done by officers of the Imperial Russian Navy and by Russian geographers in the Arctic ocean during the last fifteen years. One expedition, first under the direction of Mr. Knipovich, and then under that of Mr. Breitfuss, had explored the Barents Sea chiefly for the scientific study of the waters and the fisheries. Another hydrographical expedition lasting ten years had made surveys of the coast of Nova Zemlya, and of the Kara sea as far as Dickson bay to the north of the river Yenissei under the direction of Colonel Wilkinski, who had died only a few days previously. This expedition had also collected a great amount of meteorological, oceanographical, and biological material, and by means of beacons had rendered practical the sea route along the mouths of the rivers Obi and Yenissei. In order to give greater security to the navigation on those shores, the Russian Government is now setting up four radio-telegraphic stations in suitable places.

Prof. Gerhard Schott of Hamburg read a paper in which he gave an account of what was done in Germany in order to interest shipping companies in the scientific exploration of the Atlantic, and stated a new oceanographical point of view for the proposed labours. He said that in the Ninth International Geographical Congress held in Geneva, it was recognized that the physico-biological exploration of the Atlantic was one of the most urgent tasks in the field of oceanography, and appointed for this work an international committee which held its first meeting in Monaco in 1910. He held, however, that more funds were required for the

satisfactory carrying out of the work. A stay of only from six to twelve hours at a station on the high seas was not sufficient to obtain the mean values of temperature, salinity, etc., at different depths, and he cited examples to prove that a single observation in regions where there are not only superficial, but deep tides has not a truly scientific value. He held accordingly that it was indispensable to ascertain by provisional expeditions the nature and extent of daily and periodic variations which are found almost everywhere, and, since it would be necessary to stay at least twenty-four hours consecutively at every station, and perhaps even for several days, it would not be possible to avail oneself of ordinary merchant ships, but one would have to make use of vessels specially equipped by oceanographers.

The views of the speaker were supported in the resolution unanimously adopted by the Congress.

Dr. W. S. Bruce having given an account of his proposed second Scottish Antarctic expedition, the proposals of Dr. Bruce were warmly supported by Admiral Peary, and Mr. Chisholm, as secretary of the Royal Scottish Geographical Society, took the opportunity to say that the expedition was also cordially supported by that society.

Mr. Vilhjálmur Stefansson then gave a brief account of the programme of his Arctic expedition, which is to set out this year under the auspices of the Canadian Government. As is known to members of this Society, the expedition is designed to start from the Behring Sea, and then to make its way into the Arctic ocean with a view of exploring an extensive hypothetical land area. Admiral Peary then spoke of the warm interest which was taken in this expedition in the United States. The National Geographic Society of Washington and the American Museum of Natural History had originally resolved to bear the expense of this expedition in equal parts, and the whole scientific world, he said, congratulated the Canadian Government on their resolution to support Stefansson's project.

The difficulties constantly encountered by geographers in the spelling of place-names were the occasion of more than one communication to the Congress. Prof. Semenov Tian Chansky in giving an account of his proposed *Index nominum geographicorum universalis* raised the difficulty in connection with the spelling of railway, postal, and telegraphic stations, and expressed the opinion that a uniform system of transcription of names belonging to countries not using the Latin alphabet should be adopted, a system in which admixtures of different alphabets, and all accents and accessory signs except the apostrophe should be avoided. On the other hand, a pamphlet was presented to members of the Congress by M. Essersky of St. Petersburg, in which a general universal alphabet of twenty-four letters, partly taken from the Roman and partly from the Russian alphabet, was suggested.

In an eloquent and lucid speech Prof. Ricchieri set forth the difficulties that had been encountered by the international committee appointed at Geneva for a settlement of this question, and stated the provisional resolutions at which that committee had arrived. Seeing that the first of these resolutions was that the rules of orthography and transcription adopted by the committee appointed to supervise an international map of the world on the scale of 1 : 1,000,000 at its meetings in London in November, 1909, are those best adapted to attain the end aimed at, the meeting resolved that it was desirable that the question of the unification of geographical nomenclature, whether graphic or phonetic, should be handed over to the International Conference to be called to consider the map of the world upon the scale of 1 : 1,000,000, as regards the choice of the means for carrying into execution the conclusions arrived at by the special committee nominated at Geneva. This resolution was also among those unanimously adopted at the final meeting of the Congress.

The papers of more especial interest were read at meetings held in eight different sections: (first), mathematical geography; (second), physical geography; (third), biography; (fourth), anthropogeography and ethnography; (fifth), economic geography; (sixth), chorography; (seventh), historical geography and history of geography; and (eighth), meteorology.

Among the communications to the mathematical section were papers by M. Lallemand on the deformations and the assemblage of the sheets of the international map on the scale of 1:1,000,000; another upon the decimal division of a quarter circle, and another upon the measurement of the elasticity of the terrestrial globe. M. Lallemand maintains that the various methods that have been adopted to determine this function accord in giving a coefficient of elasticity for the earth between that of copper and steel. Prof. Kassner gave an account of a pocket instrument for the measurement of angles based upon the principle of the Jacob staff. Prof. Marinelli showed, on behalf of the Military Geographical Institute of Italy, specimens of its work designed to represent the morphological forms characteristic of Italy. The collection consists of one hundred sheets, and it is intended to complete it by preparing a similar set for the colonies.

General Schokalsky made a statement with regard to new measurements of the surface of Asiatic Russia, and the basins of the Russian Empire made by himself and others, and set forth the principles upon which his calculations were made. He also gave an account of the new hypsometrical map of the government of Moscow on the scale of 1:168,000.

In Section II., Physical Geography, General Schokalsky in one paper gave an account of the present state of hydrographical knowledge in Russian seas. In another paper he made a communication in regard to recent changes in level of the Caspian sea, pointing out how the considerable lowering of the level of that sea in 1910–1911 was to be ascribed to the diminished discharge of the Volga, which accounts for two-thirds of the total lowering of the service of the waters.

Prof. Platania of Catania made a statement with regard to the observations made in the Straits of Messina at the time of the recent earthquake regarding the intensity of marine shocks and the height and velocity of propagation of gravitational waves, and the characters of the stationary waves in different bays. He also spoke of an international organization for the study of volcanoes, and likewise made a communication with regard to the forms of giant pot-holes, from which it resulted that such pot-holes could be hollowed out even in hard basalt without the necessity for the presence of large blocks set in rotation by the waves.

Prof. Cholnoky drew attention to the remarkable phenomenon of the lowering of the mean daily temperature in Central Europe by one degree in the beginning of June in west Russia, Germany, Austria and Hungary. This diminution of temperature is accompanied by an increase in the prevalence of the west winds from 25 per cent. at the end of May to 75 per cent. about the second week of June, and is also the beginning of the rainy period in Hungary. These changes, he said, were coincident with the bursting of the monsoon in India, and might, he thought, be ascribed to the same cause. Prof. Woeikof supported the speaker in regarding Europe as being from a climatic as well as other points of view, nothing else than a peninsula of Asia.

Prof. Sapper gave an account of what he called *Bodenflüsse*, "ground rivers," that is the phenomenon of masses of earth containing large quantities of water which are able to flow on like rivers, and invited geographers to make laboratory researches and observations on the ground such as he had done in Costa Rica, the results of which he expounded. Prof. Ricchieri read a communication upon the Italian nomenclature of sea bottoms, a nomenclature which, like the other

international nomenclatures, was based on morphological and not morphogenetic characters. Prof. Simotomai described a remarkable phenomenon observed at the time of the eruption of the volcano of Usu in Japan, an eruption lasting from 1910 to 1912, in the course of which a strip of land 2 kilometres long was elevated to the extent of about 150 metres and then became slowly depressed again by about 60 metres.

Section III., Biography, had only one sitting, in which papers were read by Prof. Descombes of Bordeaux on "The Struggle against the Denudation of the Globe," Prof. Begrinot (Padua) on "The Biological Types of the Geographical Botany of Libya," Dr. Azzi on "The Grouping of Biotypic Elements in Biogeography," and Prof. Toniolo (Padua) on "The Polar Limits of the Olive in the French Alps and Western Venetia." Prof. Descombes, after pointing out the growing necessity for reafforestation and the difficulties in the way of such operations, gave an account of the excellent results that had been achieved by the French Association for Forest Management.

In Section IV., Anthropogeography and Ethnography, an interesting paper was read by Dr. D. P. Fischer on "The New Life of China." It was only within the last few years, he said, that the Chinese had felt the urgent necessity for a revivification of their civilization. They had begun to provide themselves with an army and navy, first under foreign direction, and had afterwards attempted to raise and train a national force independently. They soon saw, however, that this was impossible without a new system of education, and that this again involved fundamental reforms in their civil administration, finance, etc. The result had been the great movement which led to the fall of the Manchu dynasty and the establishment of the present political organization. In this work valuable assistance was given, especially in the transformation of its educational system, by British, Americans, and Germans, and he concluded with an appeal to the Italians to recall the glorious memories of the days of Marco Polo by taking their part in the work. A paper by Prof. Biermann, of Lausanne, on "The Geographic Framework of Civilization," roused a good deal of discussion, in which Prof. Silva Telles (Lisbon), Prof. Woeikof (St. Petersburg), and Prof. Nieuwenhuis (Leiden) took part, the speakers expressing high appreciation of the skill with which Prof. Biermann had maintained his thesis, but all agreeing in thinking that he had attached too much importance to the geographic factor to the neglect of others which ought to be taken into account. Mr. Vilhjalmur Stefansson then gave an account, with lantern illustrations, of the "White Eskimo" whom he had discovered in Victoria Land.

Among the papers read in Section V., Economic Geography, which had only two sittings, may be mentioned that by Prof. Zimmerer, of Ratisbon, on "The Commerce of the Danube with the East," and those of M. Semenov Tian Chansky and Baron Tornauw, Councillor of State, both of St. Petersburg, on the commerce and industry of Russia. Prof. Zimmerer brought forward facts and documents to prove that the Danubian commerce, contrary to the common opinion, had never suffered any interruption either through the Venetians at the time of the Crusades or through the Turks after the fall of Constantinople. From the time of the Romans an uninterrupted chain of stations had existed along the Danube from the castle of Ratisbon to the Sulina mouth, a chain which had remained intact under Byzantine, Slav, and Turkish rule. M. Semenov Tian Chansky gave an account of a work in thirteen parts, extending to 3000 quarto pages and illustrated by a wall map on the scale of 1 : 1,680,000, dealing with the commerce and industry of European Russia by regions. It is the first attempt in economic literature to illustrate the commercial and industrial value of a country, the number of its enterprises, and the volume of its transport both by land and water, and that according to a system absolutely

new. In order to represent cartographically the commercial and industrial life of the regions of European Russia the turnover of each of them has been calculated in roubles per head of the population, and the region has been tinted in lighter or darker shades according to the intensity of this circulation. The regions so coloured are not the artificial Russian "governments," but groups of contiguous communes forming regions or districts more or less natural with reference to the special purpose of the work. The number of these districts is 1065, but these again are associated for the sake of general study in 75 subdivisions, and these again in 12 large divisions. Baron Tornauw's communication related to the whole Russian Empire, giving an account of a new manual of geography of that empire in comparison with other powers. With regard to the present commerce of Russia, he drew attention to the fact that the Russian exports were no longer confined to raw materials, but showed a constantly increasing proportion of semi-manufactured and finished articles.

Section VI., Chorography, sat on two occasions along with Section II. In one of the two other meetings of the section Prof. Brückner (Vienna) read an account of the results of the voyages of the *Najade* for the exploration of the Adriatic, a paper accompanied by excellent lantern slides showing the various cruises of the *Najade* and the results of the observations made on salinity and temperature. In the other separate sitting Prof. Cholnoky (Kolzsvár) gave an account of the scientific exploration of the great Hungarian lowlands (Alföld). This work was due to a committee of the Hungarian Geographical Society under the honorary presidency of Prof. Lóczy (Budapest) and the administrative direction of the reader of the paper. It was divided into eleven sections, dealing respectively with geology, physical geography, hydrography, meteorology, botany and plant geography, zoology, anthropology, ethnography and demography, archæology, history, cartography, and agriculture. The investigations of the committee receive support from the State, the different counties and towns, as well as from various other bodies. The work of the different sections is fairly well advanced. It has been discovered that the structure of the deeper layers of the Alföld is somewhat complicated, and Baron Roland Eötvös has, with the aid of his instrument called the gravimeter, ascertained that there is a great mass deficiency under Kecskemét, a rather intensive earthquake centre. A network of earthquake observing stations has been set up, and it is intended to establish also a network of stations to observe the behaviour of underground water. The archæological investigations have led to particularly interesting results. The Alföld has been found to yield an exceptional abundance of prehistoric remains. On its northern margin have been discovered the traces of a vast irrigation system from the Bronze age, and there are numerous remains of Roman roads, camps, and settlements. About ten years' further work will be required before the committee is able to publish its results, but it may be mentioned that next year the Hungarian Geological Institute will publish a general agrogeological map of the Alföld, to the preparation of which the committee will contribute important material. Prof. Supan followed with a communication on the use of the name Europe, which, he declared, designated only a historical not a geographical entity, and accordingly should not be used in physical geography as the name of a part of the world. It is neither a separate part of the world nor a peninsula of Asia. It consists of two parts, Russia belonging to the Asiatic trunk, while the remainder is a peninsula with its own morphological characters altogether different from those of Asia.

In Section VII., Historical Geography and History of Geography, there were several papers of exceptional interest. Colonel Gerini gave an account of the travels of the Jesuit Father Giov. M. Leria in Indo-China between the years 1639 and 1659. Born in Vercelli in 1597, he died at Macao in 1665, after spending a good forty-four

years in the exercise of his ministry in various states in Indo-China. Having arrived in Cochin-China (Annam) in 1622, he was driven thence along with the other missionaries in 1639. Being sent to the country of the eastern Laos, he attempted to reach his destination by Siam. He went to Ayuddhya, the capital of Siam, by sea (1640), and having obtained a safe conduct joined a merchant caravan, and with it reached the Laos country, probably ascending the Menam and then turning eastwards. He was, however, obliged to turn back. He then tried another route. Coasting the east side of the Gulf of Siam in a small boat, he ascended one of the mouths of the Mekong to Udong, then the capital of Cambodia (1641), and having obtained the necessary permission, set out the following year with a party of Laos merchants returning to their own country, and ascended the Mekong, upwards of 900 miles, as far as Wien-Chang. There he remained for four years, during which he succeeded in ingratiating himself at court and mastering the Lao language, in which he composed various treatises. He likewise proposed to the king various works designed to improve the navigation of the Mekong, particularly at the well-known formidable Khong rapids. The king then entrusted him with an embassy to Tongking. Starting on December 2, 1646, he reached Kesho in 1647, being thus the first European to traverse the mountains separating the basin of the Mekong from Annam, having evidently followed a route which was not again trodden till August Pavie went the same way in 1889. Having returned in the same year to Wien-chang, he was again despatched to Tongking at the end of 1648. Hostilities breaking out between Cochin-China and Laos, he returned by sea and river to Udong, and there vainly awaited the opportunity to return to Wien-chang till 1659, when he was compelled by the state of his health and his advanced age to give up the idea. He was sent to Siam, and there he remained apparently till about 1665, the year of his death. His journeys, in the opinion of Colonel Gerini, are so important that his name deserves to be dragged from oblivion and placed at the head of the list which includes Mouhot, Garnier, and Pavie.

Prof. Oberhummer (Vienna) read a paper on "A Geographical Lexicon of the Ancient World," which led to an animated discussion. Prof. Almagià (Padua) made a contribution relating to the oldest collections of non-Ptolemaic printed maps. Till a few years ago, he said, it was thought that these were found in the Dutch atlases of Ortelius (*Theatrum orbis*, 1570) and Mercator (Atlas of 1595). But it was now known that that is not so. The oldest collections of the kind are Italian. They go under the name of Lafreri, a Frenchman (†1577), but settled from 1544 in Rome, and from the researches of the reader of the paper it would appear that similar collections were made and sold about the same time at Venice by Paolo Forlani, a Veronese. Such collections, however, are extremely rare, and differ from the Dutch atlases in being composed of maps of different dates and sizes and not being made up into volumes.* The collections are important in view of the great authority which Ptolemy still retained at that time, and also on account of the intrinsic value belonging to some of the maps in virtue of their content. Prof. Almagià accordingly urged the importance of saving those relics before they were dispersed or damaged. He knew of the existence of a score of those collections in Italy (six in Florence, four in Rome, one in Venice, one in Treviso, one in Parma, one in Milan, two in Turin, and one in Palermo, besides two discovered by Prof. Errera at Bologna and two examined by Prof. Revelli and himself in

* A copy of Lafreri's collection was presented to the Society by Lord Peckover in 1905 (*Journal*, vol. **26**, p. 130). That the maps were meant to be eventually bound together is shown by the issue of an engraved title, of which the border was used by Nordenskiöld for the title-page of his 'Facsimile Atlas.'—[Ed.]

the private library of Prince Trivulzio in Milan). The catalogue of W. Ruge enumerates similar collections in the libraries of Germany, and there are eight or nine other collections elsewhere.

Prof. Andrea Veress (Kolozsvár) gave an account of the description of Transylvania by the Jesuit Antonio Possevino of Mantua in 1584. Sent to the north by Pope Gregory XIII., he managed to put an end to the war between Poland and Russia. On this occasion he became acquainted with Stephen Báthory, King of Poland, on whose persuasion he betook himself to Transylvania in the spring of 1583 to arrange the affairs of the Jesuits established there a short time before. The result of this visit was a work hitherto unpublished containing the first systematic description of Transylvania as regards physical features, climate, ethnography, and political conditions (Transylvania was then a separate principality), the cities and fortresses, the inhabitants and their manners. It is noteworthy that Possevino has preserved in his work many Latin inscriptions of the ancient Dacia, which no longer exist. The work is now just published as the third volume of the *Fontes Rerum Transylvanicarum*.

Prof. H. Wagner (Göttingen), in a communication on Toscanelli's letters and map of 1474, defended their authenticity against the criticisms of H. Vignaud ; and Prof. Oskar Nachod (Grünewald) gave an account of the oldest manuscript special map of Japan, that of Fernão Vaz Dourado, of the date 1568.

In Section VIII., Methodology reports were read as to the teaching of geography in various countries—in Germany by Prof. Wagner, in Great Britain by Mr. F. Grant Ogilvie of the Science Museum, in Portugal by Prof. Silva Telles, in Hungary by Prof. Erödi, in Austria by Prof. Brückner, in Italy by Prof. Ricchieri.

Prof. Helbronner, of Nancy, in the same section, moved a resolution to the effect that "The Congress proposes the creation of mixed international commissions to regulate the questions arising with regard to names along the Alpine frontiers, and recommends that in the event of those commissions not being able to agree on a single name for a locality (mountain, pass, etc.), they should fix definitely the correspondence between the two names used on opposite slopes." The resolution was unanimously adopted, and confirmed in the final general meeting of the Congress.

At this final meeting it was, after a brief discussion, unanimously decided that the next meeting of the Congress should take place at St. Petersburg in 1916. A proposal that Spanish should be added to the languages recognized by the Congress was withdrawn as inopportune.

In the course of the Congress a visit was paid by the members to the International Institute of Agriculture, where they were graciously and hospitably received by the Marquis Cappelli, President of the Institute, and the Marchioness. Sunday, March 30, was devoted to local excursions ; one to Tivoli, Hadrian's Villa, and the Villa Este ; one to Ostia to see the results of the excavations that have been made there, and the third to the Castelli Romani, the Villas Aldobrandini at Genzano and Frascati and the Abbey at Grottaferrata being visited by the way. The excursionists were favoured with fine weather, which indeed prevailed during most of the sitting of the Congress.

REVIEWS.

EUROPE.

'GREECE of the Twentieth Century.' By P. F. Martin. (London: Fisher Unwin. 1913. Pp. 391. *Maps and Illustrations.* 15*s.*) After the customary rather perfunctory topographical description, this volume deals with Greece in her economic, social, and political aspects, for the most part very fully, but with

a certain lack of balance. It may be suggested that too much space is devoted to figures and other details of a purely transitory character; even at the present moment the author would find plenty of revisional work for another edition. On the other hand, most of the work bears evidence of very close observation and of careful judgment on the important public problems which Greece has to solve. There are some admirable photographs.

'Ski-runs in the High Alps.' By F. F. Roget. (London: Fisher Unwin. 1913. Pp. 312. *Maps and Illustrations.* 10*s.* 6*d.*) This book will interest the growing number of those who know Switzerland as "the ice and snow rink of Europe." It attempts nothing more than narrative and hints to followers of the sport. The illustrations are indifferent, and the maps are quite worthless: blurred, over-reduced, and too faint in colour, they do no sort of justice to their originals.

ASIA.

Ancient Kurdistan.

'Une relation de la huitième Campagne de Sargon.' By F. Thureau-Dangin. Paris: P. Geuthner. 1912. *Map and Plates (of the cuneiform text).* 36 *fr.*

The Department of Oriental Antiquities in the Louvre is responsible for this elaborate publication of a very large clay tablet, inscribed with a report rendered by Sargon II. about his campaign of the year 714 B.C., in what is now Eastern and Central Kurdistan. Sargon, the inheritor of the highly organized military empire instituted by Assurnatsirpal and perfected by Tiglath Pileser II., was himself the greatest of the Assyrian soldier kings, the one who pushed his boundaries farthest towards the Caspian and the Black sea, without attempting the ruinous conquests of his successors in Elam and on the Nile. The main peril of Assyria in his time lay in a possible coalescence of fighting tribes in the northern and north-eastern regions about the lakes of Van and Urmia. At the moment it seemed as though the comparatively stable power of "Urartu" (= Ararat), which had come into being round the first of these lakes, might develop into a formidable nucleus, to which would be joined the fighting strength of many peoples, mostly newly come from either the Transcaucasian steppes or from eastern Iran; and Sargon undertook campaign after campaign, both to humble the Vannic kingdom and to break up its possible allies. He succeeded so far as both Urartu and the west Urmia tribes were concerned. None of these threatened serious danger again. But he did not break other tribes, partly Scythian, partly Iranian, lying to south-east, south, and east of Urmia, though he raided and blackmailed them once and again; and in the event they attached themselves to another nucleus, that of the Medes, and came down a century later to the sack of Nineveh.

Since two of the tribes, the Mannai and the Parsua (if this name really = Persians), which were attacked on Sargon's eighth campaign, were destined to emerge from obscurity and play great parts in the history of West Asia, a report which throws light on their earlier condition has much historical interest. But the chief value of such reports is undoubtedly geographical or topographical. The cuneiform official records of Babylonia and Assyria, to which must now be added those of the Hittite Cappadocians, have already given us a corpus of ancient geographical names, sufficient to fill most of the blank spaces on our pre-Greek map of West Asia, did we only know where to put them precisely. Till we do know, we cannot trace the history of the West Asian empires on any sure lines. But every fresh document, deciphered and published, helps, and from

the geographical point of view M. Thureau-Dangin's last publication is of unusual importance.

The campaign entailed a long circular march from Calah (Nimrud) out and back through the lands of the Urartian allied tribes and across the central Vannic kingdom itself. The one fixed point in the itinerary is the Lake of Van, indicated with certainty, not only by references to its waters, but by the names of towns mentioned near their shores, and containing in some cases known names of kings of Van. The lake was reached by a circuit from the south-east. The question is, how wide was that circuit? Did it, as M. Thureau-Dangin does not doubt, include the country east of Lake Urmia, Urartu being entered at last round the north of the lake? or did Sargon keep more to westward and southward?

It is to be observed that, though the Lake of Van is expressly described in the report, that of Urmia is not mentioned at all. M. Thureau-Dangin attaches no weight to this omission, and for two reasons in chief holds that Sargon went right up into Azerbaijan. The latter's professed objective was a land called Andia, which in an inscription of Adad-nirari IV. is said to lie far from Assyria towards the "Sea of the rising sun." If this sea is the Caspian, then Andia must be in Azerbaijan, and Sargon must have gone to the east of the Urmia lake. But is it? Many students of Assyrian geography understand by that phrase the Lake of Urmia itself, holding the Caspian to have been practically unknown to the Assyrians; and there is very great probability in their view. Sargon had to do with the Mannai, and entered their country. He says they were neighbours of the Medes. Here is a very uncertain indication. We do not know how far west the Medes had pushed by 714; but in the light of their future history it seems likely that they had reached the shores of the Urmia lake and the Zagros range by Sargon's time. In that case, the Mannai have to be looked for further west and south. Now, there is nothing in Sargon's report to indicate clearly that he passed Zagros on this eighth campaign. If, after leaving the Shehrizor plain, he turned north through the western outliers of Zagros, the indications of the report are satisfied; and the mountain Uaash, of eternal snow, about which some of his later operations were conducted (identified by M. Thureau-Dangin with Sahend), can easily be found in the Alpine regions of Hakkiari or Herki; or even it may be Ararat itself.

Sargon does not appear to have been out for more than the usual summer campaigning season. He does not allude to any such exceptional difficulties as he must have encountered had he started early in the year or continued late, and after his return there was time to compile and inscribe this report within the year, as the name of the eponymous magistrate proves. On this ground, and because of his silence about the great Urmia lake, we feel inclined to believe that Sargon made the narrower circuit. We should look for Andia no farther away than west or north of that lake, and should suppose both the Mannai and the Medes to have come already much further west than M. Thureau-Dangin places them at this time. Even the Medes, the more eastward lying of the two, would be found on the Assyrian side of Zagros very few generations later.

The rest of Sargon's circuit offers less difficulties, thanks to the fixed point of the Lake of Van. M. Thureau-Dangin's identification of the city of Uaiais, frontier town of Urartu, with Bitlis is valuable, and his tracing of the return route, with its raid eastwards into the Musasir country, is open to no objection. But on the whole question may we say this? Geographers, wishing to identify tribal districts mentioned in records of royal Assyrian campaigns, must bear in

mind the obvious magniloquence of such records. A small tribal district, confined to one valley and its laterals, is, doubtless, often spoken of in the same terms as much vaster areas; and the great majority of the conquered "countries" enumerated one on the top of another to the glory of a Great King, were probably not larger than the modern holdings of Kurdish beys in those same mountainous lands. D. G. H.

THE ANABASIS.

'L'Anabase de Xénophon (Retraite des Dix Mille).' By Colonel Arthur Boucher. Paris and Nancy: Berger-Levrault. 1913. *Illustrated.* 25 *fr.*

This sumptuous production may supply a valuable military commentary on the Anabasis; but since the author elbows Strabo, Ptolemy, and such standard authorities out of his way, when their clear statements about the position of localities mentioned in the text do not square with what he considers to have been military necessities, we must decline to attach much geographical value to his book. Evidently Colonel Boucher has neither explored much of the ground himself nor gone to good authorities to learn about it. One example of his defects and method will be sufficient here. On the strength of a belief that the Syrian desert comes northward up to the latitude of Birejik, he puts Strabo, Ptolemy, etc., aside, and places Thapsacus about 100 miles above its known situation—in fact, at Birejik itself. But, as a matter of fact, a fertile and well-watered country begins nearly 100 miles south of the latitude in question, on the Syrian side of the Euphrates, and Colonel Boucher's "desert," through which, he says, it would have been impossible for Cyrus to lead his army, was in antiquity the agricultural tract from which the great temple at Hierapolis (Mumbij), described by Lucian, derived its immense wealth, and nowadays supports hundreds of villages.

'Siam, and its Productions, Arts, and Manufactures.' A descriptive catalogue of the Siamese section at the Turin Exhibition, 1911. Compiled by Colonel G. E. Gerini. Hertford: printed by Stephen Austin and Sons. 1912. *Map and Illustrations.* Exhibition handbooks are not as a rule of more than ephemeral interest, but the Siamese Section at the recent Turin exhibition was organized with the special object of outdoing the previous efforts of the State in the matter of international exhibitions, and in this Siam achieved a noteworthy success. The numerous statistical and economic chapters are, for the most part, excellently written by Colonel Gerini, and the introduction, containing a historical retrospect of the communications between Siam and Italy, is particularly instructive. As a general and up-to-date description of a rapidly developing State, this handy volume should prove generally useful.

'The Land that is Desolate.' By Sir Frederick Treves. (London: Smith, Elder. 1912. Pp. viii., 284. *Map and Illustrations.* 9*s.*) This is a narrative of a visit to the Holy Land, and almost throughout the work the author holds close to the theme which he sets in his title, from the first chapter, when he lays down that "there are few first glimpses of famous spots that are not disappointing" (a questionable view, questionably illustrated by the example of Niagara), to the last, in which a railway accident and a storm at sea go far, in themselves, to justify his attitude. Sir Frederick Treves is known as a writer of descriptive power in the geographical sense, and his word-pictures of the country he saw in Palestine are valuable.

'The Hero of Herat.' By Maud Diver. (London: Constable. 1912. Pp. xvii., 442. *Map and Portrait.*) This is an account of the work of Major Eldred Pottinger, C.B., on the north-west frontier of India and beyond, in 1837 and following years. A sequel dealing with his return to Afghanistan is promised. The narrative, full of dialogue and picturesque incident, reads rather like fiction than like history, but the setting has been no less carefully elaborated than the facts. These form a fine record, worthy of perpetuation.

'Men and Manners of Modern China.' By Rev. J. MacGowan. (London: Fisher Unwin. 1912. Pp. 351. *Illustrations.* 12*s.* 6*d.*) The writer of this book is one who believes in a great future for the Chinese nation. He has half a century's experience of the country, and has travelled widely in it. Some of his studies of Chinese life are very intimate, and may be read by geographers with interest.

'China and the Manchus.' By Herbert A. Giles. (Cambridge: University Press. 1912. Pp. viii., 148. *Map and Illustrations.* 1*s.*) This is a volume of the now familiar Cambridge Manuals of Science and Literature. It comprises a sketch of Chinese history from the tenth century to the setting up of the republic early in 1912, but the greater part of the book is occupied with events of the last two centuries, leading up to those of the last few years. Condensed as it necessarily must be, it is thoroughly readable, and forms a convenient guide to the understanding of present events.

AFRICA.

Italians in Tripoli and Cyrenaica.

'Pioneri Italiani in Libia. Relazioni dei delegati della Società Italiana de Esplorazioni geographiche e Commerciali di Milano 1880–1896.' Milan: Vallardi. 1912. Pp. 599. 4to.

This volume contains a dozen different narratives of the delegates who, in 1881, were entrusted with the task of exploring Tripoli and Cyrenaica and their hinterland in the interests of Italian commerce. As indicated in the title, the journeys and sojourns in the coast regions between Tunis and the Egyptian frontier are confined to the sixteen years 1880–1896, and are thus subsequent to Rohlfs' researches in 1879, and to Barth's still earlier journey along the coast in the forties. The majority of the narratives deal with excursions in the early eighties.

Several chapters deal with Tripoli, Benghazi, and Derna; one by G. A. Freund describes the coast route from Benghazi to Tripoli, past the Gulf of Sidra; and a short article by Prof. G. Schweinfurth treats of a visit to the port of Tobruk, near the Egyptian frontier. Captain Camperio tells of his preliminary visit in 1880 to Tripolitania, and of his subsequent expedition with Signor Mamoli to Cyrenaica; while Signor P. Longo supplies a general essay on the order or organization of the Senussi. It will, of course, be understood that the statistics and information conveyed in the different narratives are somewhat antiquated, most of these dating thirty years back, this being especially so in the case of the account of the distant and little-known city of Ghat from the pen of Signor D. Kraus, which occupies the whole of chapter iii. Signor Kraus, however, explains that he has never seen Ghat, and that his principal source of information is a prince of Ghat, named El Hagi Athman ben Amar, whose good faith, however, he has every reason to rely upon implicitly. Ghat was at that time not a centre of production in any respect, but a mart of exchange between Bornu and Hausaland on the south, Timbuktu and Tuat in the west, in the North

Ghadames, Tripoli, Tunisia, Algeria, etc., and in the east Murzuk, Augila, and Egypt. Twice a year a grand fair was held in Ghat, one in the hot season and one in the winter. From the south came ivory, slaves, and ostrich feathers, the latter being re-exported to Tripoli aud valued approximately at 400,000 francs (£16,000) per annum. Signor Kraus says that Ghat is probably the only city in the Turkish Empire where slaves were then being openly sold in the public thoroughfares. The Turks were quite aware of the traffic that goes on, but afraid to interfere for fear of the unpopularity that would attach to any attempt to abolish the trade. The number of slaves annually imported is uncertain, but two thousand was then certainly a good deal below the mark. The trade was carried on through the medium of Mohammedan agents in Tripoli, several of whom owed their wealth to direct or indirect participation therein. A list of European travellers who have visited Ghat shows that they amount to eleven in number, the three most recent being H. Duveyrier, E. von Bary, and L. von Csillagh (1879). The only British travellers were Clapperton, Walter Oudney, and James Richardson (1850). There are 140 small photographic illustrations in the volume under review, but it may be doubted whether their purpose might not have been equally well served by the inclusion of a score or so of larger and better selected pictures, the practice of reproducing mere small-sized snap-shots being of doubtful value.

Boyd Alexander's Last Journey.

'Boyd Alexander's Last Journey.' With a Memoir by Herbert Alexander. London: Edward Arnold. 1912. *Illustrations and Map.* 12*s.* 6*d. net.*

The tragic fate of Lieut. Boyd Alexander—murdered in April, 1910, near the Wadai-Darfur frontier—is fresh in the memory not only of all those interested in the exploration of Africa, but of that much wider circle of people who honour the deeds and the memory of brave and modest men who give ungrudgingly their energies and life itself to the cause of science and of humanity. When it is fully recognized, as this book clearly shows, that Boyd Alexander perished in a chivalrous attempt to preserve the peace between the French in Wadai and the Furian tribes owing allegiance to the Anglo-Egyptian Government in the Sudan, Frenchmen and Britons will join to pay renewed tribute to the patriot who sought to serve both his country and his country's friends.

To Mr. Herbert Alexander we owe a double debt—for the diary as well as for the memoir of his brother. It seems almost incredible, but we are assured that until this last journey, from which he never returned, Boyd Alexander kept no diaries. The story of his great Niger to Nile expedition was written entirely from memory and the maps of his route, by going over which he was able to recall events. But the mental strain which this method entailed determined him to keep a diary when he set out again for Africa in December, 1908. This diary was recovered intact by the French after Boyd Alexander's murder, and is carried down to twelve days previous to his death, at which time he was at Abeshir, the capital of Wadai, which he was the first Englishman to visit. The diary reveals the man in an intimate fashion. He had no white comrades; the death of his brother Claud and of Captain Gosling in his former trans-African expedition had determined him that no more lives should be risked in similar adventures, but he was accompanied by José Lopez, the Cape Verde islander who had been with him in all his travels since 1897. Primarily an ornithologist, Boyd Alexander's interests extended to other branches of natural history, while his attainments as a geographer were considerable. Next to birds he liked best to study men, and the ethnological and historical notes

scattered throughout the diary form a valuable addition to the knowledge of Central African tribes.

The scientific results of the journey the diary describes have already been made public. Here it is necessary only to recall that after visiting the islands of Fernando Po, Principe, Annobon, and São Thomé to make collections of the avi-fauna, Boyd Alexander traversed Kamerun (witnessing an eruption of its great volcano), crossed into Nigeria to Ibi, on the Benue, and thence by Yola and Dikoa made his way to Fort Lamy. With the permission of the French he continued his journey to Wadai, reaching Abeshir at a moment when the French hold of that town was very precarious. Boyd Alexander's object was to travel to Khartum *viâ* Darfur, and he sent letters to Sultan Ali Dinar, seeking permission to pass through his territory. This permission was granted; but before Alexander received this news he had, with the consent of the French, hurried on to Dar Tama to try and prevent hostilities between a raiding force of Furians and the French troops. By the Furians, ignorant of Ali Dinar's intentions, he was murdered. Mr. Herbert Alexander states that "a word of thanks" for his brother's patriotic deed is still awaited. Boyd Alexander deserved this honour, and if official recognition be lacking, the publication of his diary will put his memory right with his countrymen. His death was not due to any foolhardiness, though now we know that had he waited a little longer at Abeshir he might have finished his journey in safety. Besides the valuable ethnological notes, the diary contains many vivid descriptions of land formations and some illuminating criticisms of Spanish, Portuguese, German, British, and French methods of administration. There is also the touching story of his faithful little dog San Thomé.

Mr. Herbert Alexander's memoir of his brother is a brief and admirable piece of writing, accomplishing that which it sets out to achieve—the portrait of a man whose life was not alone void of offence, but was that of the best type of an English gentleman, though, indeed, the Alexanders are of Scottish descent. Boyd Alexander is the last and not the least illustrious of the men who take rank in the roll of great African explorers.

F. R. C.

Uganda Peoples.

'On the Backwaters of the Nile. Studies of some Child Races of Central Africa.' By the Rev. A. L. Kitching, M.A. London: T. Fisher Unwin. 1912. *Illustrations and Sketch-maps.* 12*s.* 6*d. net.*

The races inhabiting the outlying parts of the Uganda Protectorate are now undergoing that change which comes over primitive peoples when brought into contact with Western civilization. Mr. Kitching, of the Church Missionary Society, has done an admirable piece of work in this study of various tribes among whom he has lived, and whose mental outlook he has shown a marked capacity for understanding.

Three main types of the inhabitants of the Protectorate are described—Bantu peoples of Bunyoro and Toro, Nilotics, and Nilotic-Hamites. No attempt can here be made properly to appraise the anthropological work Mr. Kitching has done: it is considerable. The peoples of Bunyoro and Toro have been dealt with by other writers, but the author has several new things to tell about them. When writing of the tribes of Northern and North-Eastern Uganda he is on ground little traversed previously. He takes the Gan as typical of the Nilotic people, and his use of this, the native name of the tribe, is indicative of the exactness of his style. Usually the Gan are called by the Bantu name Akoli or

Acholi, but it is noteworthy that Speke, telling of the memorable journey in which he discovered the Nile source, calls these people Gani. Speke traversed their country, and, like Mr. Kitching, was struck with their close racial connection with the Madi. The Gan are a fine race, and should prove an asset to the Protectorate. For his third type the author selects the Teso, a tribe, akin to the Turkana and Suk, which dwells in the land between Lake Kioga and Mount Elgon. This is the district which is becoming the great cotton producing area of Uganda, and it is of interest to learn that among the Teso the men are rather addicted to hard manual labour. They are also addicted to other things, it would seem, but they are cheery and goodnatured, and a Teso, "whether drunk or sober, hovers round [a visitor] in a transport of effusive welcome." There are many things in this book which all who are called upon to work in Uganda—or among other "child races"—should bear in mind; perhaps none is of greater importance than the need to comprehend the language of the people. Mr. Kitching himself, by his valuable philological labours, has set an excellent example. He is also to be commended for the attention he has paid to native music.

The opening chapters give the reader just that topographical knowledge he needs. He gains a vivid impression of what the country looks like, and is skilfully shown the effect of geographical environment on human progress. The illustrations are very good, but the map might be better, and the index is of scarcely any value. It does not even give the entry "Gan."

F. R. C.

Northern Rhodesia.

'In South Central Africa.' By J. M. Moubray, F.R.G.S. London: Constable & Co., Ltd. 1912. *With Map and Photographs by the Author.* 10s. 6d. *net.*

This book is the result of six years' experience gained by the author while engaged as a mining engineer in Northern Rhodesia. It contains a good topographical account of a region still imperfectly known, and valuable information concerning the native races. The ordinary reader may confidently consult it as a trustworthy guide; the professed anthropologist will regret that Mr. Moubray does not always specify the tribe about which he is writing. Some exciting hunting adventures are given. The author, though he does not go deeply into social problems, has some pertinent things to say concerning the position of blacks and whites. The white man in Rhodesia, he holds, must not be afraid of manual labour. As in other parts of South Africa, the danger in Rhodesia is, it appears, that the white man may sink to the position of a mere overseer—a position irreconcilable with South Africa being in a true sense a white man's country. Like all observers who do not take short views, Mr. Moubray recognizes the great debt the country owes to the missionary. His remarks on the subject (pp. 34–35) are eminently sensible. In some comments on Congo officials, the author strikes the same note that Lord Cromer has sounded—that character is of greater importance than brains. And an essential of success in one in any position of authority is close contact with and understanding of the people. Mr. Moubray fulfilled this condition, and to this fact is due the chief value of his book. It has enabled him to draw a picture of the people which is full of little intimate touches, helping the reader to make some progress in that now fashionable, and commendable practice, of "thinking black."

AMERICA.

North-West Mexico.

'New Trails in Mexico: an Account of One Year's Exploration in North-Western Sonora, Mexico, and South-Western Arizona, 1909–1910.' By Carl Lumholtz. London: T. Fisher Unwin. 1912. *Maps and Illustrations. Price* 15*s. net.*

Mr. Carl Lumholtz is an old traveller in north-west Mexico who broke new ground in his 'Unknown Mexico,' which dealt with his journeys in the Sierra Madre among the Tarahumare and Huichol Indians. In the volume under notice he gives an account of his journeys in the states of Arizona and Sonora, between which lies the boundary-line of Mexico and the United States. This was the country known to the early Spanish chroniclers as Papagueria, the land of the Papago Indians, a half-nomadic race which is rapidly disappearing or changing its way of life and becoming merged in the mixed race of the frontier.

Mr. Lumholtz always engaged Papago Indians, medicine-men for choice, as his guides and companions, and never missed an opportunity of gathering and recording information about the habits and traditions of the race. He had the good fortune to be present at the great Sahuaro festival, when wine is made from the fruit of that giant cactus which plays so important a part in the life of the Papago. While the wine is being prepared, two evenings are spent in dancing and singing, in which Mr. Lumholtz joined heartily and was told that "he was all right and danced the proper step," which evidently put him in favour with the Indians. The wine-making is connected with the usual Indian belief in the medicine-man's power of attracting rain.

Papagueria is a desert country which (apart from the sand-dunes near the coast) has little the appearance of orthodox desert. To quote the author's words—

"Contrary to the popular conception of deserts, the one in question has vegetation, wonderfully adapted to its environment. During the year I spent there I never saw any plant, bush, or tree suffering from want of rain, in spite of the fact that the winter passed without the customary showers. Nothing appears scorched from the sun, for desert plants are slow to dry up as well as slow to grow. Next to the healthy though sombre colour of the vegetation and the scarcity of trees, that which strikes the observer most when first travelling in the desert region is the isolation of each bush or plant. It is as if they were growing in a nursery. This arrangement is made necessary because the plants need large spaces from which to gather the scanty desert moisture, sending their roots out horizontally all round, or, if they grow in the bottoms of valleys where water is not too far below the surface, sending the roots over 50 feet down to reach it."

The animals both wild and domestic have accommodated themselves in a most wonderful way to the want of water. Cattle will live for months without any other water than that from the juice of the cacti. On one occasion the author's horses and mules, although travelling during the daytime, had no water for seventy-six hours. However, the author came to the conclusion that donkeys are beyond comparison the best animals for use in the exploration of the American desert.

An account is given of the ceremonies connected with the visits of the Indians to the great salt deposits on the Pacific coast. The author traversed the country in all directions, and the volume is provided with two maps, partly from his original surveys, and is illustrated with a number of excellent photographs.

A. P. M.

PHYSICAL AND BIOLOGICAL GEOGRAPHY.

Mediterranean Lands.

'Lebensbedingungen und Vegetationsverhältnisse der Mittelmeerländer und der atlantischen Inseln.' Von Prof. Dr. M. Rikli. Jena: Gustav Fischer. 1912. *With numerous Plates and Figures, and several Maps.*

The author includes in the term "Mediterraneis" all the countries of the Mediterranean basin in the more limited sense. He briefly summarizes the conditions under which the plants of this area have to live, thus: There is great dryness accompanied by high temperature, and a mild winter and strong sunlight. The effect of these conditions is to produce an extremely xerophil vegetation. During, or immediately after, the winter rain period bulbous and corm-bearing plants, together with cryptophytes and annuals, spring up. These are followed by woody plants and perennial grasses. Then succulents and hairy plants make their appearance. The spring plants now die down, and there is apparently a great lack of vegetation. This is, however, only due to many plants being still hidden below the soil, waiting for the autumn and winter rains. These very rapidly bring out to the full all the individually and specifically numerous Mediterranean plants. The author then goes on to a description of "Makaronesia," which includes the Cape Verde islands, the Canaries, the Madeira islands, and the Azores. Here the climate is almost subtropical. There is little rain and that in winter, the summer being without rain, so the climate is very dry. In addition, there are very desiccating winds. The result is an intensely xerophil vegetation. The different types of vegetation are first discussed in a general way, and then the details are given with regard to the separate islands. The book is excellently illustrated by a number of reproductions from photographs.

O. V. D.

GENERAL.

A Hungarian View of Geography.

'The Geography of National Culture, and the Geographical Fatalists.' By Dr. Géza Czirbusz, Professor of Geography in the University of Buda-Pest. Buda-Pest, 1912.*

Such is the peculiar title borne by a recent Hungarian work. The author is Dr. Géza Czirbusz, Professor of Geography in the University of Budapest. It is not a scientific work, and can demand no scientific criticism. It will be well, however, to give some idea of the character of the contents. The book is an outburst of 383 pages (octavo) against modern geographical tendencies—especially against physical geography—and it is expressed in language which defies description. The chief question discussed is whether physical or human geography is the more essential, and it is shown that the exponents of the two are eternally contending with one another. That which is called geography by Richthofen, Lóczy, Penck, Brückner, Mackinder, Herbertson, and Martonne is not geography, but "geogony," "geosophy," etc.

Fatalism, the writer states, is a stage in the development of humanity; Mohammedanism and Buddhism are fatalism. Among the fatalists are "Kant and Laplace in astronomy, Lyell and Hutton in geology, Charles Darwin in zoology, G. Darwin in astronomy, Richthofen in geography, Spencer in sociology, Bastian in ethnology, and Herbertson in human geography."

The following are given as examples of fatalism: (1) To attempt to determine,

* 'A Memzeti Müvelödés Geografiája és a Geografiai Fatalisták.' Irta Dr. Czirbusz Géza.

from the dark lines of the spectrum thrown on the screen, what are the elements in the heavenly bodies which revolve through billions of miles; (2) "the well-known superstition of the European physicists that the order of the Universe can only be explained by Newton's law.

"Geography is neither more nor less than a *description* of the Earth; not of the whole Earth, but of its *habitable* surface. Geography is the science of the present state of the Earth; explanation is a matter for history and the exact sciences.

"Geographers are interested only in the present picture and in the economic and historical advantages and disadvantages belonging to it. Their interest can go no further. The eternal search for the principle of evolution is therefore unnecessary, and is not the task of geographers.

"No matter if the simple description of geological facts and events appears deadening to the dilettante, such, nevertheless, remains the principal task of geography.

"The geographer will never explain reasons and changes without the help of other sciences; and it is not his business to do so. It is sufficient if he points out the geographical circumstances; the explanations he may leave to others.

"It is not to be denied that the geographer must estimate the degrees of culture and include them in his picture of humanity; but he must draw no deductions from that."

The contents, which are of varied interest, show, amongst others, the following headings: Fatalism in the Past; Fatalism in Modern Times; Natural Science Fatalism; Fatalism in Physical Geography (Mackinder and his Fallacies); Fatalism in Anthropogeography (Herbertson and company, a monophysitical, anthropogeographical concern).

It is extremely difficult to understand what the author's conception of geography really is, so confused is the book and so full of contradictions. Moreover, as one reads page upon page of language which is, to say the least, surprising as coming from a professorial pen, it is difficult to remain serious. The attitude of Prof. Czirbusz to geography is emphatically not to be taken as typical of Hungarian geographers in general, and this work, emanating from the University of Budapest, will come as a great surprise to those who do not know its author.

Mrs. Cornish's Travels.

'The Travels of Ellen Cornish.' By Vaughan Cornish. London: Ham-Smith. 1913. Pp. xvi., 293. *Maps and Illustrations.* 12*s.* 6*d.*

This volume has been written as a memorial to Mrs. Cornish, who died in 1911, to the regret of many who shared her interests in geographical research. The reader will learn from these pages the extent to which she inspired her husband in his well-known work upon the various phenomena of waves, and also in his observations upon the Panama canal works. These interests of hers were based on a profound appreciation of scenic beauty; it clearly appears in the present narrative that she possessed the gift of a mind sensitized to the record of things seen during her travels, and that they remained with her as precious memories. The book deals with journeys which she and Dr. Vaughan Cornish made between 1903 and 1910, when their occupations, as he says, "were more varied, and the incidents had more of human interest" than during previous travels. They ranged widely—from England to Japan, from Japan to the Falls of Niagara, to Panama, and to Jamaica. This memorial is written very simply and with restraint, and it makes the closer appeal for that.

Dr. Cornish's description of the Falls makes no less attractive reading for those who have visited them than for those who require to be saved "from the confused notion so commonly entertained of what 'Niagara' is." The physical character of the falls is set forth (with the aid of a map and photographs) in terms devoid of technicality, yet revealing the results of scientific observation; the author naturally found especial interest in the course and forms of the falling water, and more particularly in its behaviour in the rapids. These were closely investigated; the results, descriptive of the movement of the waters and the types of waves remarked, are dealt with here at some length, and it may be added that the author has somewhat elaborated his view of the cause of the notable "cross-stream travelling waves" in the Middle Rapid. Whirling bodies of water, upwelling and sinking one alongside the other, preserving their individuality as they travel through the quieter waters of the Lower Rapid and even lower still, are forcibly described and form a phenomenon not generally appreciated and full of interest.

The Panama Canal works were visited in 1907, 1908, and 1910. Mrs. Cornish had several relatives of distinction as engineers; her interest in engineering work was beyond the common in her sex, and she clearly instilled it into Dr. Cornish. For we find here a pretty close description of the works and their administration, having regard to the space at command; the two chapters devoted to this subject deal rather with the observations made during the visits than with any speculation or geographical theorizing as to the future of the canal and its effects.

The experiences of Dr. and Mrs. Cornish during the Jamaica earthquake of 1907 are well known to readers of the *Journal*, and the brave act of Mrs. Cornish in protecting her husband is not to be forgotten. Having escaped the peril, they were impelled to make a full investigation of its causes, and this was carried on during a visit as lately as 1910. Dr. Cornish assigns to the causative disturbance a superficial, not a subterranean, position. He believes that the earthquake "could have been produced by the redistribution of load by the existing rivers flowing in their present courses." He indicates two areas, northern and southern, where the tremors originated, and supposes "a disturbance of pre-existing equilibrium by this modern redistribution of load, that the southern tremors came from subsidence with fracture near the mouth of the Hope river, and that the northern tremors were produced by elevation with fracture near the Gaps." This theory is, of course, definitely associated with the author's work on waves, and it is interesting to observe that it was suggested to him by his study of landslides on the banks of the Panama canal, in which he was able to observe what may be termed a type-movement by which gravity reduces "the slope of materials not under stress, but standing too steeply for their weight, cohesion, and internal friction." The adaptation of this theory to the physical condition of the island of Jamaica cannot be quoted here, but reference may be made to the conclusion that if equilibrium was restored at the time of the earthquake, no such serious visitation should afflict the island for a long time, as suitable conditions must, at worst, be slow of reproduction.

The maps illustrating this volume are good, and most of the photographic reproductions are successful.

THE MONTHLY RECORD.

THE SOCIETY.

Assistant Secretary.—The Council have appointed Mr. Arthur R. Hinks, M.A., F.R.S., First Assistant at the Cambridge Observatory, and R.G.S. Lecturer in Surveying and Cartography at the Cambridge School of Geography, to the position of Assistant Secretary.

EUROPE.

The New Waterway between Berlin and the Oder.—The approaching completion of this great undertaking, which has involved an outlay of over £2,000,000, renders opportune an article setting forth the history and probable effects of the scheme, contributed by P. Friedrich to the *Deutsche Rundschau für Geographie*, vol. 35, Part 7. The influence of Berlin's favourable situation in respect of internal navigation on its economic development has often been pointed out. It forms a meeting-point of waterways giving it communication with the ports of Hamburg, Stettin, and Danzig; with the timber districts of the Vistula; with the coalfields of Upper Silesia; and with the gardens and orchards of Bohemia. So important is this water-traffic that it has only of late been slightly exceeded by that of the railways. Schemes for improving the natural facilities by canals were put forward so far back as the sixteenth century, though the actual connection of the Oder with the Spree on the one hand, and the Havel on the other, was not effected until considerably later. The most important link was supplied by the Finow canal between the Oder and the Havel (making use of the old depression by which the Oder once found its way west to the North sea), which gave communication with the Elbe as well as with Berlin. Of late years this has proved insufficient for the greatly increased traffic, and the making of a new canal by a very similar route was taken in hand by the Prussian Government. It begins in the north-west of Berlin, where it makes use of the much-enlarged Spandau canal, and, bending north and east (making use of the canalized Havel for a part of the way), terminates at Liepe, on the old course of the Oder. Its length is 100 kilometres, its surface width 33 metres, and its depth in the centre 3 metres. A great advantage over the old canal consists in the fewness of the locks, these being almost entirely concentrated at the eastern end, where a difference of level of 33 metres is negotiated by a succession of five locks, each large enough to accommodate a train of six barges at a time (in length they nearly equal those of the Panama canal). A constant water-supply has been secured by drawing upon the copious lakes of the Werbelliner Heide. It is expected that the new canal will greatly develop the river-trade, especially in coal, between Berlin and Stettin.

Longitude of the Belgian Observatory, Uccle.—The exact longitude of this observatory was for the first time determined by modern methods during 1912. Previously it had been obtained in one or other of various circuitous ways—some of them depending on observations of more than half a century ago—the results being naturally far from concordant. The difference from Greenwich had been given in one case through the intermediary of Brussels, in another of Paris, in a third of Brussels, Berlin, and Potsdam, and in a fourth of Brussels and Leiden. The result obtained by way of Paris, while making use of the Paris-Greenwich difference obtained by precise methods in 1902, depended for the rest on an approximate determination of that between Uccle and

Paris by means of rhythmic radio-telegraphic signals from the Eifel Tower. The new determination still proceeds by way of Paris, a particularly favourable opportunity of exchange of signals between the Paris and Uccle observatories having offered itself last year. The operations were carried out under the direction of M. Renan, of the Paris observatory, Belgium being represented by M. Delporte. M. Renan has presented a detailed report, and a brief abstract of the result has also been printed in the *Comptes Rendus* of the Paris Academy and in the *Bulletin de la Classe des Sciences* of that of Belgium. The Greenwich-Uccle difference works out as $17^m\ 26^s{\cdot}054$ E., which is in very close agreement of that previously obtained by the rhythmic signals from the Eifel Tower. It differs from the older values by from 0·4 to 0·9 sec.

ASIA.

Sea-level Changes on the Japanese Coasts.—An investigation of the variation of the sea-level at the mareograph stations round the Japanese coasts during the period 1894–1910 has been carried out by the well-known seismologist, Dr. F. Omori, who records the results in the *Bulletin of the Imperial Earthquake Investigation Committee*, vol. 5, No. 2. Changes in the water-pressure on a sea-bottom are of special interest to seismologists by reason of their possible effect as a secondary cause of earthquakes, but the results also concern the physical geographer as indicating the changes now in progress in the relations of land and sea. The paper gives tables showing the mean yearly height of the sea-level at the several stations, and these data, translated into curves, bring out the fact that the variations have more or less definite points of similarity at the different stations. The greatest range at any one station amounted to 285 mm. (11·2 inches), the time-interval in this case being ten years. Dr. Omori discusses the relation of the changes of level to those of barometric pressure, and finds that the former are on the average 2·4 times greater than the amounts attributable to changes in pressure. While the effect of barometric pressure may cause the secondary changes in the height of sea-level, it does not appear to govern the general course of the variation. The effect of temperature cannot so easily be allowed for, but Dr. Omori finds that the correction required is probably small in comparison with the total differences of level. Wind seems to have played an unimportant part, and its effect is neglected. The general result is to show that since 1898 the level has tended to fall at one group of stations and to rise at another. Dr. Omori gives a map in which (by interpolation between the stations of the two groups) he has drawn the boundary-line between the areas affected by the two movements. This shows that while the south-eastern part of the main island, the north-east corner of Hokkaido, and the vicinities of Nagasaki and Kilung in Formosa (on the Pacific side of the Japanese arc) are apparently undergoing depression, the rest of Japan is being elevated, with the greatest rate in the neighbourhood of Ayukawa.

American Race-affinities in Eastern Asia.—The well-known ethnologist, Dr. A. Hrdlička, last year visited parts of southern Siberia (east and west of Lake Baikal) and northern Mongolia, with a view of testing the truth of the idea that archæological remains, or even survivals, of the physical stock from which the American aborigines were derived, should exist to this day in some parts of Eastern Asia. The means at his disposal only permitted Dr. Hrdlička to visit the more accessible territory, though this was at the same time the most important for his purpose. He likewise added to his data by studying the anthropological collections of the various Siberian museums. One line of evidence is supplied by the burial mounds or "kurgans" which occur in thousands

over large areas. Of these the more recent yield skeletons with brachycephalic skulls, which occasionally quite closely resemble American crania of the same form. The older mounds, particularly those in which no metal occurs, again yield an increasing number of dolichocephalic skulls with frequent close resemblances to similar skulls of American Indians. Remnants of native populations are still to be found among whom dolichocephalic individuals are quite common, often bearing a remarkable physical resemblance to the American Indian. Dr. Hrdlička came in contact with representatives of many different tribes—Buriats, Ostiaks, Mongolians, Tibetans, Chinese, etc.—and found among them many unmistakable traces of admixture or persistence of what appears to have been an older population, partly brachycephalic and to a smaller extent dolichocephalic, the individuals representing these vestiges resembling to the point of identity American Indians of corresponding head form. The indications observed were much more numerous than Dr. Hrdlička had ventured to expect, and he considers that they are too many to be accidental, while they cannot be found in regions not peopled by the yellow-brown race. He has been able, however, merely to touch on the subject, and its further investigation remains for the future.

AFRICA.

The Western Sahara.—The reconnaissances of the early travellers in the Western Sahara, with few exceptions, were of an exceedingly rough character, and until the French occupation of Adrar, the mapping of this region was quite untrustworthy. Recent work of French officers has to some extent remedied this defect, and the beginnings at least of a more accurate map have now been supplied. In a paper contributed to the April (1913) number of *La Géographie*, Lieut. G. Schmitt gives such a map accompanied by a useful sketch of our knowledge of the Western Sahara (especially Adrar and the districts north and north-west of it) based on his own route surveys and those of Lieut. Petit, and on information obtained from the natives. He also gives an outline of previous exploring work in this part of Africa. In his description of the country he makes full use of the copious native terminology for the various natural features of the region (occasionally without sufficiently interpreting them for the benefit of the uninstructed), and in his map defines the limits of the districts recognised in the country, many of which, he says, correspond very closely with natural entities. Adrar, although often spoken of as mountainous, is in reality merely a plateau (*dhar*) trenched by valleys which alone determine the relief. With its plentiful supply of dates, it forms a vast oasis, water being found in abundance at a slight depth. It is the only region in which a sedentary population has been able to take root, but its delectable characters have often been exaggerated. The plateau falls abruptly to the north and west by escarpments, traversed only by difficult paths, to a series of *rags* or gravel-strewn plains. Regions of dunes extend both east and west, but they do not, as was once thought, constitute a continuous zone; nor does the eastern area (the "Makter") connect with the dunes of the Igidi to the north-east, but rather bends eastward towards the Juf—the still unknown tract separating Adrar from the Timbuktu region. All the dune-areas are characterized by parallel undulations running from north-east to south-west, and separated by depressions of greater or less width. A number of different *rags* are distinguished, but all have the same character of gravel or boulder-strewn plains, broken here and there by ridges of quartzite and domes of granite. Whereas the dune-areas form the principal pasturages, being covered with the most lasting herbage, the *rags*

produce vegetation only after rain, and though excellent for flocks, the plants are of quite other species and wither quickly. It is the *rag* which has always conveyed the most decided impression of the desert. Towards the west there are undulating surfaces of a whitish aspect, in great part composed of limestone. Between the undulations there are *weds* which seem to have once united in a narrow depression running from north to south. Lieut. Schmitt gives full details as to the most feasible routes, the location of wells, etc. The latter are rare in the dune-areas, and are here mostly *oglats* or shallow wells of a temporary character, while it is in the *rag* that the deep and perennial wells occur. One of the most important is that of Bir Moghrein—the most northerly point reached by the writer—which seems to lie on the most promising route by which a junction might be effected with southern Morocco and Algeria.

Survey Work in Italian Somaliland.—An official report has been issued by the Colonial Department in Rome on the geodetic and topographical operations carried out in Somaliland, during the two years from June 1910 to June 1912, under the care of Captain Egidi. The first field selected for this work was the territory traversed by the Juba river between Jumbo and Margherita, where were situated several concessions of land granted to European applicants. As the surveys based on the triangulation were intended to help in the alignment of roads, the demarcation of property, irrigation canals, and other public works, it was decided to carry out the survey on the scale of 1 : 50,000 instead of 1 : 100,000 as originally proposed. A line of levels was also run alongside of the river Juba to help in the irrigation works. The party embarked at Naples, on June 5, 1910, and disembarked at Mogadishu three weeks later, whence they subsequently made for Brava and Jumbo. The Juba has many points of similarity with the lower Nile : during the rains it is navigated by steamers, but in the dry season native canoes are the only craft that can ply thereon. The climate is particularly damp and hot, and though healthy near the sea, close to the river malarial fever is rife, and the tsetse fly infests the locality. The monsoons, however, blow through nearly the whole of the year and thus help to make the normal heat bearable. Owing to the absence of any prominent hills, or of marked undulations of ground, it was necessary to construct and erect all the trigonometrical stations. The only ground suitable for the measurement of a base was the portion between Buloboda and Bulomerera. The second part of the operations lay in the tracts between Brava on the coast and the Webi Shebeli, which runs about parallel thereto, and the third in the region between the Webi Shebeli river and the coast on the south and north of Merka as far as Jilib. The areas surveyed in the three districts amounted to about 950 square kilometres on the lower Juba, on the scale of 1 : 50,000 ; 900 square kilometres about Brava on the 1 : 100,000 scale ; and 800 square kilometres round about Merka on the 1 : 50,000 scale, and the resulting maps have been sent home and duly reproduced.

AMERICA.

Snowfall of the United States.—The *Quarterly Journal of the Royal Meteorological Society* for April, 1913, contains a valuable contribution to this subject by Charles F. Brookes. He has produced a map showing the aggregate annual depth of snow over the entire area of the United States. The snowfall of the country as a whole is great for so low a latitude, the average annual undrifted depth being between 10 and 50 inches over the greater area, over 100 inches in the neighbourhood of the Great Lakes, and as much as 400 inches (36 feet) locally in the Rockies—a chain of mountains, which, especially in the Canadian portion, is probably the snowiest region in the world. New York gets

about 30 inches of snow in the course of a year. In the extreme south, as in Texas and Florida, the quantity is trifling. Mr. Brookes's paper would have been much enhanced in value had the seasonal relationship of the snowfall of the United States been also represented (as it is, it only discusses the aggregate depth of successive falls, which may be separated by complete thaws), but of course this aspect of the subject may be followed up later. We very much regret that a similar map of the snowfall of the British Islands has not yet been constructed, as the comparison with that of the United States would doubtless be of great interest. We know from general experience that the north of England gets very much more snow than the south, and the difference seems to be much greater than the comparatively small difference of latitude alone would account for, especially in view of the fact that during the coldest time of the winter the mean temperature in the south is nearly as low. The anomaly may be connected with the great extent of elevated ground in northern England, which, naturally getting a very heavy snowfall, has the effect of increasing the snowfall in the neighbouring lowlands. It seems not unlikely that, apart from the cooling influence of a mass of snow upon neighbouring regions, snow which is falling thickly tends, according to some unknown mechanical action, to bring down further snow in marginal districts where the temperature in the ordinary way might be just high enough to turn it to rain. The fact, for instance, that Manchester gets as much or more snow in a single winter than London gets in five, may be as much due to the vicinity of the former city to the High Peak of Derbyshire as to its location 200 miles farther north.

Prof. Bowman's New Expedition.—Prof. Isaiah Bowman, who took part in the Yale Expedition to Peru in 1911 (*Journal*, vol. **39**, p. 225; **41**, p. 491), passed through London in May on his way to the same part of the world, where he will be in charge of a new expedition under the auspices of the American Geographical Society. Some account of his plans is given in *Science* for May 9. He is accompanied by Mr. H. S. Palmer as geologist and surveyor, and will devote his attention to that part of the Central Andes lying in Peru, North-West Argentina, with adjacent parts of Chile and Bolivia. The work of the expedition will be concerned with both anthropogeography and physical geography. In the Puna and desert of Atacama the climatic conditions will be studied, and it is hoped to secure data on past changes in this respect. The region will be crossed, if possible, along two different parallels where the contrasts in altitude are most marked, the distribution of the people being thus studied under extreme conditions of physical environment. The last part of the time will be devoted to the basin of Lake Titicaca and the Desaguadero, and an attempt will be made to determine the old strand-lines of Lake Minchin —the vanished lake which once occupied a part of the Bolivian tableland—and investigate its relations with Titicaca. The Tiahuanaco valley and its famous ruins will also be studied in relation to the supposed ancient levels of the lake and the limits of food production in the valley to-day.

Dr. Koch's Second Expedition in Northern Brazil has been brought to a close by the traveller's arrival at Manaos on the Rio Negro in March last. The June number of *Petermanns Mitteilungen* contains a brief account of Dr. Koch's doings from the time of his start up the Uraricuera river, the western branch of the Rio Branco (*Journal*, vol. **39**, p. 401). The ascent of the river was rendered arduous by rapids and the unusually low water-level, as well as by want of supplies, no inhabitants being met with up to the neighbourhood of the Marutani mountains—a sandstone range resembling Roraima in form. With great difficulty the water-parting was crossed into an unhealthy region on

the upper Caura, where the party suffered from malaria and shortness of supplies. Heavy rains now added to their troubles, but the Ventuari, an almost unknown tributary of the upper Orinoco, was reached in a region of forest-clad mountains at the junction of the Serra Parima with the so-called Serra Pacaraima (not a continuous chain). The winter was spent among the Ihuruana Indians, after which the Ventuari was descended to the Orinoco, its course being found to be broken by violent rapids. From San Fernando de Atabapo Dr. Koch reached Manaos by way of the Cassiquiari. A route survey and copious ethnological data are the result of the expedition.

AUSTRALASIA AND PACIFIC ISLANDS.

Mr. Wollaston's Expedition to Dutch New Guinea.—Mr. A. F. R. Wollaston, who reached England in May (cf. *Journal*, vol. 41, pp. 391, 492), sends us the following statement: "By the middle of December, 1912, a large store of food had been accumulated at a camp three days' march from the last river-camp. This camp was on an outlying ridge of the foothills at an altitude of about 2500 feet, and from it we obtained a view of the Utakwa valley of great value in determining our further route, a wide panorama of the Nassau range extending 100 miles east and west, whilst almost daily the snow peaks of Mount Carstensz, 30 miles to the north, were visible in the early morning. The region thereabouts was entirely uninhabited, but natives from the higher mountains had come down to visit us, and some of them were still staying in our camp when we were ready to make a start. Three days' journey up the valley of the Utakwa brought us to the beginning of the high mountains, and the rapidly narrowing valley made it necessary to cross to the right (west) bank. The river was there a rocky torrent of great size, and it was crossed by means of loops of rattan running on a single rattan stretched from bank to bank: this was replaced later by a proper rattan bridge. Another depôt of food was made at that place, and a preliminary excursion undertaken in order to find a route to the higher ranges and a place for another food-camp three marches further on. In the middle of January a start was made, and after a third depôt of food had been established nine days' march from the river (about 6000 feet), we proceeded up the valley of the Banderong, and in three days arrived at a point (10,500 feet) from which we were able to reach the snow-line (about 14,200 feet) of Mount Carstensz. On January 30 an ascent was made with Lieut. Van de Water to the snow-line; and on February 1 with Mr. Kloss to a point several hundred feet higher, where further progress was barred by steep ice, the bergschrund of one of the small glaciers which trickle down from the ice-cap covering the mountain. Lack of supplies necessitated a retreat on the following day, a disappointment which was to some extent mitigated by the clouds that hid the mountain continuously during the four following days. At an altitude of between 5000 and 7000 feet the character of the forest changes considerably; the trees become smaller, the undergrowth is less dense, and more herbaceous plants appear. At about 8000 feet the characteristic trees are casuarinas, which give place higher up to flowering shrubs, heaths, rhododendrons, etc.; these, with a deep undergrowth of moss, grow up to between 10,000 and 11,000 feet, where the rocks become so steep that only the smallest plants find a foothold. As seen from the south, Mount Carstensz is a great escarpment of limestone rock, and the ascent is made without serious difficulty from ledge to ledge. During the time that we were in the mountains we were nearly always accompanied by some of the natives, who inhabit the region between 4000 and 6000 feet. They were extremely friendly, and were of the greatest assistance to the expedition in showing us their tracks through a very steep and

difficult country. They are people of medium stature, and they cultivate sweet potatoes and yams, and a small amount of sugar-cane and tobacco. Their weapons consist of bows and arrows, stone axes, and stone knives. Many objects of ethnographical interest were brought back, as well as large zoological and botanical collections. The health of the expedition was in general very good, especially in the absence of beri-beri, which was so disastrous a feature of the expedition to the Mimika river, 1909–11. The expedition left New Guinea on April 3."

Other Expeditions to the New Guinea Snows.—Captain Herderschee's expedition (*Journal*, vol. 40, p. 336; 41, p. 170) has successfully completed its task, having for the first time reached the highest point of Mount Wilhelmina, securing valuable scientific collections. It will be remembered that the snows of Mount Wilhelmina were first trodden in 1909 by Lorentz and Van Nouhuijs (*Journal*, vol. 37, p. 477), but that the actual summit was not reached by them. The height is given as 4750 metres (15,580 feet), as against the 15,700 odd feet of Mount Carstensz. The latter peak, it is announced, is the objective of a new expedition undertaken by the German explorer Dr. Moszkowski (*Journal*, vol. 37, p. 567), who will once more approach it from the north. On the other hand, a Dutch expedition under Captain Weyerman is said to be approaching Mount Juliana, the third (most easterly) snowy peak of the Central range, by way of the Digul river.

POLAR REGIONS.

The Crocker Land Expedition.—According to a statement which has been issued setting forth the organization and objects of this expedition (*Journal*, June, 1913, p. 593), the main geographical tasks to be undertaken are: (1) the determination of the extent of Crocker Land (or islands) and delineation of the coast-line; (2) the investigation of the region west and south-west of Cape Thomas Hubbard and north of the Parry islands, to determine what land may be there; (3) the location of the edge of the continental shelf, described by Nansen as the most important feature of North Polar geography; (4) the delineation of the coast-line along portions of Grant Land and Axel Heiberg Land; (5) the study of the Greenland ice-cap from west front to summit in the widest part of the island, the rate of movement of such continental ice-masses, and the air-currents over them. Other parts of the programme have to do with oceanography, geology, geophysics, meteorology, ethnology, etc., in each of which departments the problems offered by the region to be studied will be attacked with great thoroughness. The party hopes to leave New York in the steam-whaler *Diana* early in July and to reach Cape York on the Greenland coast about August 1, there securing dogs and drivers. According to the state of the ice, a landing will be effected either at Hagler bay, Ellesmere Land, or at Payer harbour, Pim island. Permanent headquarters will be established, the winter supply of fresh meat will be obtained by hunting, and, during the late autumn and winter, supplies will be taken forward to the secondary base on Cape Thomas Hubbard. The start for Crocker Land will be made in February, 1914, and the return to headquarters completed by about the middle of June; scientific work being done on the way, as well as subsequently at the base. During the second winter the programme will be repeated, except that a party will be despatched into the region south-west of Cape Thomas Hubbard in search of new land. If Crocker Land should be found not to exist, a journey to the summit of the Greenland ice-cap will be undertaken in the summer of 1915.

Dr. Mawson's Antarctic Expedition.—Further details of the scientific work accomplished by this expedition have been given in the Sydney *Daily Telegraph* of April 2 and 21 last, in the form of interviews with Prof. David. The first dealt specially with the magnetic, the second with the geological results. It will be remembered that the expedition was generously provided with magnetic instruments by the Carnegie Institution, which is also undertaking a magnetic survey of New South Wales, to be carried out by Mr. C. Kidson. The magnetic observer with Dr. Mawson (Mr. Eric Webb, who is a graduate in engineering of Canterbury College, Christchurch, N.Z.) was trained by Mr. Kidson before setting out, and the work accomplished by him is said to be "really splendid." He formed one of the party of three led by Lieut. Bage, of Melbourne University, which made the journey of 300 miles, south-east from the main winter quarters, to the locality of the south magnetic pole. Guided by small portable sundials, the travellers pushed on over terribly crevassed ice, often in the teeth of fierce blizzards, until they reached a spot estimated to be 45 miles from the magnetic pole area. Here the dip of the needle was 89° 45′ 3″. In spite of the intense cold—constantly as much as 50° of frost, although it was summer—Webb succeeded in getting an accurate series of observations every 30 to 50 miles throughout the route. At each station, besides the tedious process of constantly magnetizing and demagnetizing the needles used with the dip-circle instrument, no fewer than thirty-two accurate magnetic readings had to be taken, as well as astronomical observations. All the party came very near perishing on the return journey, only just managing to reach the hut in the last stages of exhaustion. With the observations taken by other members of the expedition, it should be possible to locate the south magnetic pole far more accurately than ever before. It appears that Prof. David's party on the Shackleton Expedition, though within the area in which the needle is vertical from time to time through the year, was at some distance from the mean centre of that area, which may be much wider than has been thought. There may even be local poles grouped round the main pole, or distorting the shape of the polar area. In geology the results are equally striking. The science was represented, apart from the leader, by Messrs. Stillwell, Watson, and Hoadley (the two last at Mr. Wild's base), who have furnished a preliminary report. Adélie Land forms a huge ice-covered plateau, rising rather steeply from the coast-line to a height of a little over 7000 feet. At the main base (Commonwealth bay) there are outcrops of very ancient schistose and gneissic rock. East and west the outcrops are few and far between, with the exception of an important bluff 1000 feet high, discovered by Mr. Madigan. The upper 600 feet of this were formed of a blackish-blue rock of metallic type (perhaps old lava), while the lower 400 feet were composed of horizontally bedded sandstone, with bands of black coaly shale, forming, no doubt, part of the great Antarctic coalfield previously brought to light. Whether the coal will prove of economic value cannot yet be predicted. In the neighbourhood of Dr. Mawson's base traces were found of at least three minerals commonly of economic value—copper carbonates, sulphide of antimony (stibnite), and molybdenite—the last-named a scarce product much in demand for the manufacture of molybdenite steel. Several gems were also found, *e.g.* garnets and beryl, the latter sometimes sufficiently translucent and green to be termed emerald. Reports from Mr. Wild's base state that, while the winter quarters were situated on a high glacier 17 miles from the nearest point of the coast, the first outcrop of rock discovered lay 37 miles to the south-east. For the most part the land is almost encased in ice, the few outcrops

consisting of very ancient crystalline rocks. The coast runs nearly due east and west, and in advance of it are numerous islands. Ships cannot approach anywhere near this new land, for a massive ice-sheet, 1000 feet thick, creeps out from it, terminating in a vertical cliff, sometimes 200 miles from the land. The latter rises, at first steeply, then more gently, to a height of 4000 feet. The most magnificent feature is the gigantic glacier which eventually barred all progress eastward. In its descent of 3000 feet in 15 miles it has ripped out of the ice on either side enormous blocks, separated by chasms 300 to 500 feet in depth. Arrived at the sea, it spreads out fanwise, filling the bay with masses of disrupted ice, while the pressure ridges of the glacier-ice proper are driven up to 300 feet above sea-level. In their explorations to the west of the base, during which they reached the Gaussberg, Messrs. Hoadley and Dovers were once held up for seventeen days by a single blizzard. The only outcrop of rock was a granitic island 4 miles from the coast, near which was probably the largest known rookery of the Emperor penguins, estimated to contain about 15,000 birds. The whole neighbourhood was full of bird-life. Altogether 230 miles of new coast-line, besides islands, were discovered from Wild's base. In compliance with a request from Dr. Mawson and Prof. David, the King has given his approval to the naming of this new coast Queen Mary Land. The Commonwealth Government has agreed to take over Dr. Mawson's station on Macquarie island.

Return of the "Terra Nova."—The Antarctic ship *Terra Nova* reached the Scilly islands on June 12, and was there joined by Commander Evans, who took the ship to Cardiff, arriving on June 14. At Cardiff, Lady Scott, among others, visited the ship, and on June 16 the Commander and his officers were entertained at a public banquet. The work of unloading the valuable scientific collections for despatch to the British Museum was promptly commenced. It will be remembered that Cardiff was the port from which the *Terra Nova* finally sailed on her outward voyage three years ago.

Voyage of the German Antarctic ship "Deutschland."—As mentioned in the *Journal* for April (vol. 41, p. 358), the *Deutschland*, after the return of the German Antarctic expedition, undertook a new voyage to South Georgia to bring away the Argentine observers. Some valuable soundings and other observations are said to have been carried out during the voyage. The position of the South Orkneys was found to need rectification on the charts, which also fail to show a series of reefs dangerous to navigation. The soundings, combined with earlier ones taken by the *Deutschland*, show that the Sandwich island ridge is continued below sea-level towards the Orkneys, but that there is no connection with the sill of the Falklands. The reported "Dinklage bank" (between 45° and 49° S., 27° and 35° W.) was found to have no existence, and it seems probable that the Weddell sea is joined to the Argentine basin by depths of over 5000 metres (2730 fathoms). The *Deutschland* will now return to Germany, want of means preventing Dr. Filchner from carrying out his proposed return to the Antarctic.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Volcanoes and Climate.—The idea that the outpourings of volcanoes may have an appreciable effect on climate is not altogether new, but precise data have hitherto been wanting for the estimation of the extent of such effect. Recent investigations of solar radiation, in the United States and elsewhere, have already supplied material for the discussion of the subject, and of this advantage has been taken by two observers (Messrs. C. G. Abbot and F. E.

Fowler) in a paper forming vol. 60, No. 29, of the *Smithsonian Miscellaneous Collections* (Washington, March 28, 1913). During the summer of 1912 Mr. Abbot was engaged in pyrheliometer and spectrobolometer observations of solar radiation at Bassur, Algeria, while Mr. Fowle did similar work at Mount Wilson, California. The results bring out clearly the unusual degree of haziness of the atmosphere which prevailed from June onwards during last summer—a state of things which other reports show to have been world-wide, and which Dr. Hellmann has supposed (*Zeitschrift für Meteorologie*, January, 1913) to have been due to the great eruption of Katmai volcano early in June, 1912, of which some account was given in the *Journal* for April last (p. 387). Although this eruption was far from equalling the famous eruption of Krakatao as regards the violence of the explosion, it was remarkable for the quantity of ash which fell, this exceeding by many times that observed at equal distances from the place of the eruption in the case of Krakatao. After showing that periods of prolonged haziness have followed other remarkable volcanic outbreaks (including the great eruption of Asamayama, Japan, in 1783), the authors discuss their own observations, which they put forward in the form of tables and diagrams. They conclude from these that the haze produced by the Katmai eruption (June 7 and 8) began to affect measurements of radiation in Algeria about June 19, and those of Mount Wilson about June 21, the effect increasing until the middle of August or later; and that the maximum decrease of total radiation due to the haze reached nearly or quite 20 per cent. at each station. The effect is greater for the visible rays of the spectrum than for the infra-red ones, but does not increase so much as might have been supposed towards the ultra-violet portion. Dust collected on Mount Wilson was found to be composed of fragments of volcanic glass, quartz, felspar, and kaolin, but of these only the first definitely suggests a volcanic origin. An attempt was made to ascertain the effect of such haziness on the temperature at the Earth's surface, but this is a function of so many variables that general effects are found to be obscured by local ones. While a periodicity of temperature is known to correspond to the eleven-year sun-spot cycle, the range appears to be greater than is to be assigned to this cause alone. The authors find, however, a close correspondence between the temperature data and the *combined* effect of sun-spot variation and that of solar radiation as influenced by volcanic haze. The above conclusions as to the volcanic origin of the haze must no doubt be received with caution.

OBITUARY.

Lord Avebury.

THE death of Lord Avebury on May 28 deprives the Society of a Fellow of forty-two years' standing, who had served as Trustee since 1878. John Lubbock, first Baron Avebury, was born in London on April 30, 1834, the son of a father of high scientific distinction, Sir John William Lubbock, third baronet. John Lubbock entered Eton in 1845, but entered professional life at an unusually early age, only three years later, when he took up a position in his father's bank, in which he became a partner in 1856. The brevity of his scholastic education gives additional cause for wonder at his versatile scientific interests, which would have been sufficiently remarkable if only in view of his preoccupation with financial and economic affairs, in which connection alone his reputation would have been a great

one. He was a practical reformer in matters connected with banking, and he played the same part in yet other spheres of activity, for as a member of parliament his initiative led to the passing of the Bank Holidays Act (1871), and various other measures of first-rate social importance. He was prominently associated with the municipal government of the Metropolis, and was chairman of the London County Council in 1890-92. His interests in educational affairs were no less eminent, and he served the University of London as Vice-Chancellor, and the London Working Men's College as Principal. His knowledge of literature was profound, and his selection of the "Hundred Best Books" is not yet forgotten.

His own literary ability contributed towards bringing his scientific achievements into wide publicity, for he possessed to the full the faculty of presenting those scientific subjects in which he was interested in such a clothing of words that they easily attracted the attention of the general reader. They were many, ranging widely over topics of biology (and especially insect life), and including a very practical interest in archæology, which is clearly indicated in the title under which he entered the peerage. Omitting all else, we are here concerned with that part of his work which falls within the scope of geography. Of this, his book on 'The Scenery of England' (1902) may be taken as a summary. It exhibits a profound study of geology, with particular reference to morphology, but there is also evident a clear appreciation of the importance of the influence of land-forms on human settlement and activities; thus at the close of the fourth chapter, a few paragraphs summarize the influence of different types of coast-line, while the fifteenth and sixteenth chapters discuss the associations between law, custom, and scenery, and the subjects of local divisions and the sites of towns. In the last chapter he also made occasion to consider a larger geographical subject, of his interest in which we have clear evidence, not only in his 'Beauties of Nature' (published in 1892), but in vol. **6** (p. 545) and **15** (p. 46) of this *Journal*, and elsewhere. This was the matter of the distribution of land and water over the surface of the Earth, and of the configuration of the great land-masses and the ocean-basins. His views on these (in certain aspects) controversial topics are perhaps characteristic, in a measure, of his scientific work generally; they are simple, and simply expressed, and the article in the earlier volume of this *Journal* above cited may be taken as illustrating, in a manner of interest to geographers, that close attention to detail which was an attribute of all his work, whether financial, or social, or scientific—for here he sets forth a table, worked out for every tenth degree of latitude from 60° N. to 60° S., showing the proportion of sea to land along each.

Avebury's work on 'The Scenery of England' was preceded by another of similar character on 'The Scenery of Switzerland,' and these two have been indicated by a recent biographer as "perhaps the most enduring" of all his scientific works. He was connected as President with the British Association (in 1881) and with many other learned societies, while his combination of scientific and financial interests had an obvious consequence in the trusteeships which he undertook in addition to that of our own Society, such as these of the British Museum (to which he was appointed in 1878); and the British Association (1872). He succeeded to the baronetcy in 1865, and was raised to the peerage in 1900, and to the other honours he received, both at home and abroad, it is almost a temptation to apply the epithet "innumerable."

Lieut. Leycester Aylmer.

Lieut. Leycester Aylmer, K.A.R., who was recently murdered by Abyssinian elephant poachers in the Northern Frontier District of British East Africa, had been a Fellow of this Society since 1910. He was born with an innate love of

travel and adventure, and soon after taking his commission was drafted into the K.A.R., and was stationed for some time at Yonti, Jubaland. In 1907 he carried out, in company with Captain S. S. Butler, a most interesting journey through Arabia, an account of which appeared in the *Journal* (May, 1909). Later, he was associated with Mr. Archer in surveying large tracts of almost unknown country near the Abyssinian border. He contributed two very interesting papers to the *Journal* on these journeys. He was a most accomplished linguist, speaking fluently Arabic, Somali, Swahili, and Amharic. In September, 1911, he was appointed Inspector of the Abyssinian Frontier, and it was in carrying out his duties in this position that he met his death.

Dr. Pringle Hughes.

An active and adventurous career was closed last September by the death of Dr. Pringle Hughes, of Wooler, Northumberland, one of the older Fellows of the Society, which he joined in 1877. Descended from Colonel Humphrey Hughes, a confidential officer of Monk at the restoration, Dr. Pringle Hughes was educated at the Edinburgh Academy and University, completing a medical course at Paris and London (St. George's) hospitals. In 1866 he received an appointment under the Crown Colony Commissioners, and remained in their service until the absorption of that department by the Colonial Office in 1904. His official duties were concerned chiefly with the emigration of Indian coolies to the West Indies, and during extensive travel and residence in the tropics he gained a wide experience which proved of great service in his departmental work. While in the West Indies some forty-five years ago, he made the ascent of the Essequibo for some distance; but his most adventurous journeys were those carried out in 1883 in the arid regions of Central and South Australia. With one or two others, he fitted out an expedition from Adelaide to Cooper's creek and the Diamantina, and after returning to the coast, went west to Eucla, on the shore of the Great Australian bight, doing most of the journey on foot at the rate of some 30 miles per day. From Eucla, with two white men and a native, he followed the coast road for a fortnight, and then struck inland after a perilous climb up the sea-cliff. After traversing the belt of 150 miles, in which grass and water-holes occur, the party found the country more and more arid, and were forced to return, reaching Eucla in a weak state after a toilsome journey. After his retirement Dr. Hughes lived with an unmarried brother, at the home of the family, in Northumberland.

OBITUARY OF THE YEAR.

The following is a list of the Fellows who have died during the year 1912–1913 (April 30):—

S. Armitage; Chas. F. Adam; A. H. Black; W. H. Benyon; Geo. Borup; J. C. Blake; Frank Bladen; W. H. Buchan; J. S. Butters; George Baker; Colonel F. Bailey; Louis Becke; Robert Barclay; H. A. F. Currie; W. M. Corner; C. L. B. Cumming; Sir J. I. Courtenay; General J. T. Cummins; Major-General G. A. Craster; Arthur Cockshott; The Earl of Crawford and Balcarres; D. J. Collins; D. J. Crofts; Admiral J. Halliday Cave; Captain J. W. Clayton; W. T. Dunlin; Clinton T. Dent; Colonel H. C. G. Dugdale; Baron De Worms; Charles Dalton; Herbert

Druce; M. B. H. Evans; Captain R. B. England; A. Fraustadt; G. T. Ferneyhough; M. le Dr. F. A. Forel; Sir John Grinlinton; D. G. Henriques; J. G. Hitchfield; Admiral Sir R. Vesey Hamilton; Pringle Hughes; C. L. Hacking; C. E. Hovey; J. G. Hamilton; Lord Headley; Captain A. R. Hulbert; G. B. Hudson; E. S. Hanbury; Sir Clement Hill; H. P. James; D. W. Kettle; Captain A. Kent; Sir J. G. Kennedy; C. T. Knaus; P. G. Laurie; Rev. W. L. Lang; W. J. Laidlay; I. S. Lister; Lieut. J. H. Leveson-Gower; F. L. Langdale; N. T. Methley; V. T. Murché; G. S. D. Murray; F. J. Macaulay; Geo. A. Musgrave; E. L. Mitford; Henry Morris; William Mure; W. W. Martin; Lieut. B. S. Ninnis; Captain L. E. G. Oates; R. H. Prance; A. W. Paul; Sir Robert Pullar; W. C. Parkinson; H. J. Pearson; Commander E. W. Petley; Mrs. Emmeline Porcher; J. R. Radford; C. J. Robin; Admiral Sir F. W. Richards; Sir William Robinson; Colonel Sir E. C. Ross; E. G. Ravenstein; D. W. Summerhayes; Sir E. Sassoon; Major Frank Simpson; Lieut.-Colonel S. G. T. Scobell; Major P. B. Smithe; Captain A. W. Stiffe; Augustus Smith; Edward Spicer; Henry Salt; J. C. Stirling; F. Stafford; Captain R. F. Scott; J. H. W. Sheane; B. Leigh Smith; G. B. Tunstall-Moore; Sir W. E. M. Tomlinson; Lieut.-Colonel F. C. Trollope; Edward Tyer; T. H. Thornton; Benjamin Taylor; Sir Henry Vavasour; Sidney Weetman; Sir J. Wernher; T. S. Whitaker; Rev. C. Hill Wallace; D. W. M. Woodworth; Sir Raymond West; J. Pontifex Woods; J. A. Windham; Lord Wenlock; John Westlake; Levi W. Yaggy; Frederick Youle; Lady Young.

CORRESPONDENCE.

The Tsang-po.

Mishmi Hills, April 18, 1913.

In connection with the question of Kintup's exploration of the Tsang-po, referred to in Mr. Field's letter in the March number of the *Journal*, I think that the following may be interesting.

I recently met a Tibetan who has frequently travelled in the lower Tsang-po valley. Fifteen years ago he passed down the river into the Abor country as far as Mobuk (or Gobuk), some 5 or 6 miles south-east of Shimong. He confirms Kintup's report in a remarkable way, especially as regards the villages in the Abor country, though in two cases Kintup has apparently reversed the positions of two adjacent villages. This might be expected in relating his story from memory more than a year after the places had been visited.

The Tibetan tells me that above the junction of the Nagong Chu and the Tsang-po the latter river flows through a gorge through which there is no road. This confirms Kintup's report. He had never heard of any falls of the Tsang-po itself, though there are falls on a tributary; the river is said to come down in rapids. It is quite possible for rainbows to be formed over rapids, and I have seen them myself over the Lohit river.

The Survey report on Kintup's journey says, "The Tsang-po is 2 chains distant from the monastery (where Kintup and his Chinese lama were stopping), and about 2 miles off it falls over a cliff called Sinji-chogyal from a height of about 150 feet. There is a big lake at the foot of the falls, where rainbows are always observable." I do not think that from the above quotation it is by any means certain that

Kintup actually visited the falls. It reads as though he were reporting information he had gathered. Possibly the records of the Survey of India may have more definite information, or perhaps Lama "U.G.," who is, I believe, living in Kalimpong, could elucidate this point.

The Tibetan who gave me the above information had actually heard of Kintup, though he did not know any details of his movements. He tells me that many years ago a man was sent by the Indian Government to find out in what direction the Tsang-po flowed. The Government, he says, were anxious to prove that the holy waters which flow past Lhasa eventually find their way to Buddh-Gaza. The man cut thousands of logs of different sizes and of a peculiar shape, and threw them into the Tsang-po. These logs were afterwards found at Buddh-Gaza, together with others which had been thrown into the upper waters of the Ganges and Lohit, thus proving that these three rivers united in the most holy of Buddhist places.

We may, perhaps, allow rumour in Tibet to add a little romance to the foundations laid by Kintup's journey.

F. M. Bailey, Captain.

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1912-1913.

SPECIAL MEETING AT THE ROYAL ALBERT HALL.

May 21, 1912.—**The Right Hon. Earl Curzon of Kedleston, G.C.S.I., G.C.I.E., etc., President, in the Chair.**

Reception of Members of Captain Scott's Antarctic Expedition. Paper by Captain Evans, R.N.

RESEARCH MEETING.

May 22, 1913.—**H. Yates Thompson, Esq., Vice-President, in the Chair.**

The paper read was:—

"A Statistical Study of Wheat Cultivation and Trade, 1881-1910." By J. F. Unstead, M.A., D.Sc.

Anniversary Meeting, May 26, 1913.—**The Right Hon. Earl Curzon of Kedleston, G.C.S.I., G.C.I.E., etc., President, in the Chair.**

The Secretary read the Minutes of the last Anniversary Meeting, which were confirmed and signed by the President. The election of new Fellows was announced.

Elections.—*Eckley B. Coxe; Arthur Samuel Cuff; Prof. Harry W. Foote; David Hawkins; Mrs. Marion Burnside Macleod; Rev. Roger C. Morrell; G. Stuart Seaton; Arthur P. Stockings; Lieut.-Colonel Arthur Tilney* (*17th Lancers*); *Miss Daisy Wimbush, B.A.* (*Lond.*).

Presentation of Medals and Other Awards.

The President: The next item on our programme is the presentation of awards. You are all of you familiar with the circumstances in which and the reasons for which we have decided to make the particular awards of the present year. Of the two Gold Medals that are usually given one only is being awarded on the present

occasion. We could not very well give a third medal to Captain Scott. He had already received our Gold Medal and a Special Gold Antarctic Medal, and considering the matter and feeling the warmest desire to show to his memory and to his widow our recognition of the heroism of his death, we decided in place of a medal to purchase a casket to hold the two Gold Medals to which I have referred and which he had previously received. That casket it will be my melancholy but pleasing duty in a moment to hand to Lady Scott. The other of our Gold Medals we did assign to Dr. Wilson. He, alas! can never be aware of the fact that he won it, but nevertheless we felt that, as he had never received the medal before, it was open to us to give this to his widow in his memory. She also, I am glad to say, has consented to come here and to receive it, and those are the two distinctions which it will now be my duty to present. I hardly think I need preface them by reading out to you the usual record of the services of the individuals honoured. Surely at this meeting it would be out of place, superfluous, to say anything about the record or career of Captain Scott; equally unnecessary is it for me to define the particular services or merits for which we desire to honour Dr. Wilson—they are perfectly familiar to every one of us—and we shall perhaps best suit the feelings of the ladies who have come here this afternoon by not spending too much time in talking, but by simply making the presentation. It is an old silver casket with gold mounts that we offer to Lady Scott, and we ask her with a full heart to accept it as a little memorial of the intense feelings of gratitude and admiration which are felt by the Royal Geographical Society for her husband.

The President then handed the casket to Lady Scott and the Gold Medal to Mrs. Wilson.

The PRESIDENT: The third of our Medals, the Victoria Medal, which, as you know, is usually given for Research work, we have awarded to Colonel Burrard. For many years before Colonel Burrard became Surveyor-General of India he was the Superintendent of the Trigonometrical Survey Office in Dehra Dun, and was thus responsible for the success of what is probably the most important system of geodetic triangulation with which this country is interested. His chief claim for consideration, however, does not lie so much in one particular branch of scientific research, as that he has consistently supported (and in some cases personally initiated) every line of scientific inquiry connected with geodesy or geography that has recently been organized in India. It is only necessary to mention the series of pamphlets on the geography and geology of the Himalaya mountains and Tibet and the attraction of the Himalayas on the plumb-line of India, as well as more recent papers on the difficult question of Isostasy in India. He has quite recently been much interested in the Magnetic Survey of India, and the development of a primary system of levelling. He is an official adviser of the Government of India on scientific matters, and he has always been a leader in personal research into all the many scientific problems which beset the progress of geographical knowledge of India. There is not a scientific explorer of any eminence in India who has not consulted (and in some measure been guided by) Colonel Burrard. His reputation now is European, and there has probably been no Surveyor-General in India of equal scientific attainments since the days of Everest. This eminent man cannot be here to receive the Medal himself, but Major Crosthwait has attended to receive it on his behalf, and I will hand it to him to transmit to Colonel Burrard.

Major H. L. CROSTHWAIT: Colonel Burrard is unfortunately unable to attend here this afternoon in person, but he asked me to say that the award of this Medal has been a great encouragement to him, and the recognition of his work by such an important body as the Royal Geographical Society will ever be a source of satisfaction to him in the future.

The PRESIDENT: We have a special award for one of the most brilliant survivors of the Antarctic Expedition, namely, Lieut. Victor Campbell. It takes the form of a gold watch for the ability and good leadership as Commander of the Northern party, which enabled him when left at Terra Nova bay, with small resources, to bring his party through a long Polar winter and to conduct it in safety in the spring a distance of 230 miles, to the base of the expedition at Cape Evans. I hope some time in the future we shall have a detailed account of that gallant exploit. No more brilliant thing has ever been accomplished in the history of Antarctic or Arctic exploration, and in handing him this watch I hope I may assure him that we regard with the warmest interest and admiration his great personal achievement.

We now come to the other awards. The Murchison Award for 1913 goes to Major H. D. Pearson. Major Pearson has been engaged in the survey of the Sudan for about ten years past, and succeeded Colonel M. G. Talbot as Director of Surveys in 1905. Since then he has organized and carried out the Land Revenue Survey of the Gezira, Dongola province, and other parts; the topographical survey has been considerably extended, and in several expeditions he has added largely to the exact knowledge of the little-known districts of the Sudan. Besides his ordinary administrative work as Director of Surveys, he has availed himself of all opportunities to produce reliable maps of this part of Africa, and to investigate its geography. He has recently communicated a paper to the *Geographical Journal*, and has published an account of the special survey methods which he has employed. He has determined astronomically many places on which later surveys have been based.

The Gill Memorial I am about to hand to that accomplished lady Miss Lowthian Bell. This is the first occasion on which we have made an award to a lady Fellow. I do not know whether it will be regarded as a proof of the advance of the sex in the movements of to-day, or as a personal tribute to Miss Lowthian Bell. Personally I regard it as both, but with rather warmer feelings for the latter reason. For many years past we have been familiar with her travels and most admirable writings, and I feel we are honouring ourselves rather than her in asking her to accept this award.

The Cuthbert Peek Grant has been awarded to Dr. Felix Oswald for his scientific exploration in Armenia, the results of which were published at his own expense; and his more recent work in the region between Victoria Nyanza and the Kisii Highlands.

The Back Bequest goes to Mr. William S. Barclay, who some years ago gave us an interesting paper on his experiences in Tierra del Fuego and Patagonia. More recently the valley of the great river Parana has been the scene of his travels, and he gave us a lecture on this subject of great importance to the physiographic and economical development of South America.

The President then delivered his Anniversary Address (see p. 1).

The report of the Council was then read. The ballot was taken for the election of Council, and the President announced that the Council list was adopted.

The Council list is as follows; the new members or those changing office are printed in italics:—

President: Right Hon. Earl Curzon of Kedleston, G.C.S.I., G.C.I.E., etc.; *Vice-Presidents:* Major Leonard Darwin, D.SC.; Douglas W. Freshfield, *Colonel R. C. Hellard*, C.B., R.E.; Colonel Sir Thomas Hungerford Holdich, K.C.M.G., K.C.I.E., C.B.; Lord Lamington, G.C.M.G., G.C.I.E.; H. Yates Thompson, J.P. *Treasurer:* Edward L. Somers Cocks. *Trustees:* Right Hon. Lord Avebury, D.C.L., F.R.S.*; Lord Belhaven and Stenton, D.L. *Hon. Secretaries:* Colonel Sir D. A. Johnston, K.C.M.G., C.B.; Capt.

* Lord Avebury has since died.

H. G. Lyons, D.SC., F.R.S. *Foreign Secretary:* Right Hon. Sir G. D. Taubman Goldie, K.C.M.G., F.R.S., D.C.L. *Councillors:* Sir Hugh Barnes, K.C.S.I.; Admiral H.S.H. Prince Louis of Battenberg, G.C.B., G.C.V.O., etc.; *Admiral Sir Lewis Beaumont*, G.C.B., K.C.M.G.; Charles W. Campbell, C.M.G.; Douglas Carruthers; Colonel Charles F. Close, C.M.G., R.E.; *Lord Glenconner*; Albert Gray, K.C.; *Dr. A. C. Haddon*, F.R.S.; Colonel W. C. Hedley, R.E.; D. G. Hogarth, M.A.; Sir Everard F. im Thurn, K.C.M.G., C.B.; Sir Harry H. Johnston, G.C.M.G., K.C.B.; G. Wm. Lamplugh, F.R.S.; T. G. Longstaff, M.D.; *Sir Claude M. Macdonald*, G.C.M.G., G.C.V.O., etc.; *Sir Alfred Sharpe*, K.C.M.G., C.B.; *Colonel Sir J. R. Dunlop Smith*, K.C.S.I., C.I.E.; *Colonel Sir Henry Trotter*, K.C.M.G., C.B.; Colonel Sir C. M. Watson, K.C.M.G., C.B.; Sir Frank E. Younghusband, K.C.I.E.

THE ANNUAL DINNER.

The Annual Dinner of the Society was held on the evening of the Anniversary Meeting at the Whitehall Rooms, Hotel Metropole. The President, The Right Hon. Earl Curzon of Kedleston, G.C.S.I., G.C.I.E., was in the chair, and among those present were: H.S.H. Prince Louis of Battenberg; Sir Edward Grey; The Argentine Minister; The Chilean Minister; Earl Grey; Viscount Milner; The Earl of Stair; Lord Joicey; Vice-Chancellor of Cambridge University; Lord Lamington; Sir F. D. Lugard; Earl of Norbury; Sir Arthur Birch; General Greely; Sir Archibald Geikie; Sir Edward Poynter; Admiral Sir Lewis Beaumont; Colonel Sir Thomas Holdich; Sir Albert Markham; Sir Hugh Barnes; Hon. Thomas Mackenzie; Head Master of Harrow; Captain Gerlache; Sir Charles M. Watson; Sir Colin Scott Moncrieff; Major Leonard Darwin; Sir Henry Settle; Sir Everard im Thurn; Mr. H. Yates Thompson; Sir Claude M. Macdonald; Commander Evans and other members of the British Antarctic Expedition; Sir J. R. Dunlop Smith; Colonel R. C. Hellard; Sir Alfred Sharpe; Sir Henry Trotter; Sir Duncan Johnston; Captain H. G. Lyons; Archdeacon Sinclair; Mrs. Bullock Workman; Dr. Hunter Workman; Sir William Willcocks; Mr. G. W. Lamplugh; Colonel F. R. Maunsell; Colonel C. F. Close; Major Crosthwait; Dr. Felix Oswald.

Lord Curzon proposed the toast of "The King." He said: I give you the toast of His Majesty the King, who is even now engaged on a journey—though perhaps not strictly a geographical journey—in which he is repeating and emulating the example of his illustrious father.

Lord Curzon next proposed the toast of "The Queen, Queen Alexandra, the Prince of Wales, and the other members of the Royal Family." He said: In giving this toast, I would like to refer more particularly to the Duke of Connaught, our Honorary President, who has during the past year been honourably and successfully bearing his share of the burden of rule in a most important part of the Empire. You will perhaps allow me to say how we rejoice to-night at seeing the mannner in which her Royal Highness the Duchess of Connaught is emerging from her serious illness.

Lord Curzon then gave the toast of "The Guests." He said: I would point out at the outset that there has been a certain rearrangement in our toast list. On ordinary occasions the loyal toasts are followed in our list by that of "The Medallists and the Recipients of other Awards." On the present occasion we have dispensed with that toast for reasons which will be understood by all. The recipients of our principal distinctions this year cannot respond to the toast of their health. They rest elsewhere from their labours—in a land where medals mean nothing. To-night we can only do honour to their memories. This afternoon I had the sorrowful pleasure of handing to Lady Scott a casket to contain the Gold Medals bestowed by the Society upon her husband; and I also handed to another

widow, Mrs. Wilson, the Medal that I would gladly have offered to her distinguished husband. In the exceptional circumstances of the case, we have felt that it was better not to propose the health of the Medallists this evening. But although we have excluded this customary toast, we have provided for some recognition of that which has been the great exploit of the geographical year by including the toast of "Polar Exploration." That toast we have connected with the name of a distinguished visitor, General A. W. Greely. He belongs to the older school of Polar explorers. It is some thirty years since he accomplished the great feats with which we connect his name, but, from the serene altitude of his own experience, I am certain that he regards with as much enthusiasm as any of us the exploits of the younger generation which we have been commemorating during the last few weeks. About the Scott expedition I will only say that our Geographical Society is proud of the record of our men, that the cause of geographical exploration, of scientific research, and of human knowledge, has benefited greatly by their labours, and that humanity itself has been dignified and uplifted by their example.

I couple with this toast the name of the Secretary of State for Foreign Affairs, Sir Edward Grey. Perhaps the greatest compliment which has been paid within the last few years to the cause of geography has been the personality of the guests who have been willing to attend at our annual banquets at this table. Two years ago we were addressed by Lord Cromer and Lord Morley, certainly two of the most eminent and memorable Englishmen of their time. Last year we had as our chief guests the Prime Minister, the Archbishop of Canterbury, and Mr. Rudyard Kipling, an illustrious trio whom it would be hard to beat. There were also silently present Lord Crewe and Lord Milner. To-night we have as our principal guest the Foreign Secretary, whom we have drawn away, I believe not unwillingly, from that Conference table over which he is presiding with so much dignity and skill. We have also Lord Milner, whom you will hear presently, and Lord Grey who, in accepting my invitation, placed upon his undoubted powers of speech the unpardonable and inexplicable restriction that he was not to be allowed to exhibit them on the present occasion. We have further with us the representatives of Foreign and Colonial Governments, of other Geographical Societies, and of kindred scientific and artistic bodies, and we include among our guests the Commander of the Belgian Antarctic expedition, as well as the principal members of our own Antarctic expedition, whom we rejoice once more to honour.

Why is it that all these eminent persons, so representative of many different branches of public life and activity, are willing to come here in honour of geography? I do not feel inclined to ascribe it entirely to my own persuasiveness, although I am bound to say that, in my efforts to induce them to come, I have shrunk from no legitimate wile. I think rather that they come here to show their genuine interest in that science of which we of this Society are the accredited exponents and patrons. If I may use a metaphor—not I hope on this occasion a mixed metaphor—I would say that the shares of geography stand very high just now in the market of the world's appreciation. It is not merely that deeds of daring and heroism are still done by explorers and travellers, which make our blood tingle within our veins and make us proud of the race from which we are sprung. It is not merely that in the popular enthusiasm for knowledge we welcome any extension of the boundaries of science. I think the encouragement of all these eminent men springs rather from the fact that the geographer's work is now being increasingly recognized as part of the indispensable work of the nation to which we belong, and of the empire whose frontiers the geographer demarcates and sometimes accidentally extends—I put in "accidentally" in order to cover the retreat of the Secretary of State for Foreign Affairs. I say that geography is being increasingly

recognized as the foundation science of many departments of public life—the foundation science of the historian, the colonizer, the missionary, the trader, the administrator, and the statesman. Almost all of them have started from geography. If they neglect geography they make a mess of it. Geography is the basis of success in almost all these professions. Upon geographical data these persons of whom I have spoken build their knowledge of the past, they are enabled thereby to cope with the present, and they provide for the future. Further, the diffusion of geographical knowledge is one of the most potent agencies at work for the peace of mankind. In the old days how many international disputes, how many sanguinary wars, have originated from geographical ignorance, from disputed boundaries, from unscientific data, from incorrect maps. It was an illustrious predecessor of Sir Edward Grey, Lord Salisbury, who first gave vent to the aphorism that statesmen and perhaps others than statesmen ought to look at large maps. Had I at that time been President of the Geographical Society, instead of secretary to Lord Salisbury, I should have been tempted to propose him as a Gold Medallist of this Society. What he said was eminently true. Every one of his successors, including, I am sure, Sir Edward Grey, has lived ever since in that atmosphere of large maps, and in all probability the only reason why Sir Edward Grey has come here this evening, apart from his feeling for geography, has been that we are able to give him two or three hours' respite from the atlas of Eastern Europe. A picture is drawn in the Scriptures of Moses, who in the fight with the Amalekites had his arms upheld by two faithful henchmen. That is exactly the position of the Foreign Secretary in this country in the struggle which he is perpetually conducting. His two arms are supported by the diplomatist and the geographer; and, if you ask me, I have not the slightest hesitation in saying which is the more reliable prop.

Perhaps the most convincing proof that I can give you of the increasing triumph of geography is the influence which it now exercises upon our rulers. Take the House of Commons. When I was first elected to the House of Commons I remember that a not undistinguished member of that assembly spoke of Warsaw as a seaport. I believe he afterwards excused himself on the ground that Shakespeare had ascribed a seacoast to Bohemia. But then, as we all know, literary people never have been geographers, with the possible exception of Milton, who would never have written "Paradise Lost" had he not studied his Hakluyt and Purchas. They are oblivious to the importance of latitudes and longitudes, and they resent the crude restrictions of maps. There is a famous writer still living, who, a short time ago, wrote a work, appropriately of fiction, in which he described Bombay as being on the eastern shores of India; and the only way in which he could extricate the entire edition from compulsory destruction, was by inserting a slip in each unsold copy to this effect, "It must be understood that for the purpose of this book, and this book only, Bombay is on the shores of Bengal." I am not going to let out his name. Our legislators have, perhaps, advanced somewhat beyond that stage, although they still are not very strong on their geographical legs, and their experiments in geographical pronunciation are sometimes enough to make one gasp.

We have, however, an admirable example set by Ministers themselves. One of the claims—I do not say whether they be many or few—which His Majesty's present advisers have established to the confidence and affection of the nation, is the degree to which they have been willing to pursue geographical research in the intervals of their strenuous labours in the interests of the people. There is an Admiralty yacht, bearing the appropriate name of the *Enchantress*, which has almost emulated the exploits of the *Terra Nova* in its exploration of Mediterranean capes and seas. Quite lately it presented us with the spectacle of the Prime

Minister inspecting the harbours of Albania, and haranguing the citizens of Malta. There is hardly a part of the Empire which is not familiar with the leonine features of the First Lord of the Admiralty. Some Minister or other is usually to be found in Berlin, engaged in a scientific research of the Great Ice Barrier, which is supposed, I believe quite erroneously, to exist in that quarter of the globe, but which is said to be melting away in deference to the scientific researches of these eminent geographers. The Secretary of State for India and the Under-Secretary have in the last few years visited, for the first time, the country which they are called upon to administer; and even the Lord Chancellor, forgetting that he was once an engine of war, and is now a pillar of the law, and remembering only that he is a geographer, is about to make a perilous expedition to the American continent. And, finally, rumour says that a not less famous Minister, before embarking upon an extensive system of land reform in this country, is about to undertake, amid the universal plaudits of his countrymen, a prolonged geographical cruise in which to study the agrarian system in all civilized and uncivilized lands throughout the habitable globe. If I am at all correct in my analysis, it is quite clear that under the auspices of His Majesty's present advisers geography is at last coming into its own, and with the example of these illustrious folk to guide us, we shall have such a chance as we have never had before.

But, jesting apart, I should like to offer my sincere thanks to the present Government for the genuine and fertile interest they have shown in the science we profess, not merely by the presence of some of their most distinguished members year by year at our board, but by the substantial increase they have given to the subvention we receive from the State. The Prime Minister, I know, has been warmly interested in the Scott expedition, and has devoted particular concern, with most generous results, to the provision for the wives and families of those who have sacrificed their lives.

And now in proposing my toast, may I add that we feel a particular sympathy for the Foreign Minister in the arduous, complicated, and protracted business upon which he has for some months been engaged. Within my experience of public life no Foreign Minister has been so completely assured of the confidence and support of the nation. So far as we can judge, Sir Edward Grey has played the part of our representative in the councils of Europe with great calmness, with complete lack of selfish interest or self-advertisement—arts of which he is conspicuously incapable—and with commanding influence. It is of supreme importance that in an international crisis the man who speaks for Great Britain should speak with the voice, not of a party, but of the nation. That advantage Sir Edward Grey has enjoyed, and he has owed it quite as much to his personality as to his policy—since both of them in equal measure have been regarded by his countrymen as marked with prudence, dignity, and moderation. We wish him well to the end of the chapter, and we hope he may be as successful in the concluding as he has been in the earlier parts. I give you the toast of "Our Guests," and I couple with it the name of Sir Edward Grey, Secretary of State for Foreign Affairs."

Sir Edward Grey said:—You have been good enough to receive the toast of the guests in the kindest possible manner, and Lord Curzon has proposed it as regards myself, and as regards all of us who are guests this evening, in a way which has earned our sincere gratitude. May I congratulate you on having Lord Curzon as your President? He is no mere titular president. Great as his other abilities are, they would not have given him the position which he has in a society such as this if it had not been for the gifts of energy and courage which have made him personally by his own travel and exploration qualified for it. He is qualified not merely by his position in public affairs, but by his own exploits as a traveller, and

to gifts for travel he has added gifts of writing and of speech, and he has been able to apply the knowledge acquired by personal travel in positions of the highest responsibility in public life. That is a rare combination, and no one can be more qualified either by public record or by personal travel to be President of your Society.

I felt some shyness when he asked me to be your guest. I cannot say that the shyness has been diminished by the list which he has given of those distinguished men who have been previously your guests and who are also with us this evening as guests. And when he referred to the rapid way in which several of my colleagues are qualifying for membership of your Society, I could not help feeling a little abashed that I am so far behind most of them. I cannot altogether pass over in silence their travels—a subject of continual comment not merely in this room. It is my official duty on many occasions to explain that their travels are not undertaken in pursuit of knowledge. It does not follow—indeed, Lord Curzon has already animadverted on the fact that many things in public life are accidental—that a good deal of knowledge may not be accidentally acquired; and if it be accidentally acquired, the fact that it was not the primary object of the journey will not prevent it from being of profit and of use to themselves and to their colleagues who have stayed at home.

I was gratified by another passage in Lord Curzon's speech. He spoke of me as having been snatched away, he hoped to my own satisfaction, at this hour of the evening, from the Conference table with the Ambassadors at the Foreign Office. Well, the Ambassadors generally meet me at the Foreign Office at three or four o'clock in the afternoon. I am delighted to gather from Lord Curzon's speech that it is the general impression that we do not separate till about half-past ten in the evening; and if that be the general impression it is not my desire, and I do not think it will be the desire of any of the Ambassadors who sit with me, that I should correct it.

I feel a little difficulty in responding to this toast for lack of qualification. I have at any rate one negative qualification. If continual absence from home be a qualification to be a guest of the Royal Geographical Society, I can truly say that for the last twenty-eight years, or thereabouts, it has been a continual struggle on my part to live at home attended, especially in the last seven or eight years, with an almost complete want of success. But when one comes to positive qualifications, I cannot help feeling that want of travel is one of the two most common reproaches which are brought against me in private conversation. I am continually reproached with the fact that I have travelled little and that I do not play golf at all. When time and opportunity are given to me it is the former of those reproaches—that of having travelled little—that if I remove either of them I shall certainly remove. But in the present circumstances I am powerless to remove that disqualification. Lord Curzon has referred with great kindness to official work, and to the fact that I had been supported by two props. I thought at first, when he mentioned two props, that he was going to refer to the two great political parties in the State, and that I should have entirely endorsed. However good the intentions of a Secretary for Foreign Affairs or of a Government may be—however hard he may work, the success obtained must depend in a very great degree upon the extent to which it is the impression, not merely at home, but abroad, that his policy has the support of the nation. This we have enjoyed in a very high degree, and it is right that we should lose no opportunity—I especially should lose no opportunity—of admitting to what a remarkable extent it has been the case that our foreign policy has been accorded, not only by the party which supports the Government, but also by the Opposition, invariable and generous support. The two props which Lord Curzon actually did mention, the geographers and the diplomatists, I would also gladly

admit have been exceedingly useful. Further than that I cannot follow him. He went into the comparative merits of the two. Speaking as a diplomatist—I should say rather that I have learned from diplomacy that if you have the support of two props you must not, until you are prepared to dispense with one of them, investigate the comparative merits of the two. Without, therefore, investigating the comparative merits, I gladly say that the study of geography has been of the highest value, and if, as Lord Curzon said, the stocks of geography now stand high, I think it is because, no doubt greatly through the instrumentality of this Society, the study of geography has been made more intelligible and more useful. As long as it was confined to a list of names of towns, and rivers, and mountains, with special attention to the particular height of the particular mountain, it did not seem to lead us very far; but when it began to embrace the study of climates, of the natural resources of different countries, of the characteristics and capacities of the population of those countries, and of the strategic advantages and disadvantages of different parts of the world, it became clear to all of us that it was one of the most valuable and essential studies to the Empire.

Do not suppose that a very close study of these things at home has been necessary to the building up of an empire. The British Empire, I think, has been built up in past generations without very close study of these things at home. But I am convinced that it is absolutely essential for the maintenance of an Empire and especially of our Empire. There have been times, it is said, long ago when the want of knowledge on the part of Secretaries for Foreign Affairs with regard to geography was remarkable. There is some ribald story that generations ago a Secretary for Foreign Affairs gave up a place in India because he thought it was an island in the Pacific. Of course that was before the days of compulsory education. I could not help wondering, when Lord Curzon spoke of the accidental extension of our frontiers, whether sometimes a want of accurate knowledge on the part of the Secretary for Foreign Affairs may not have been responsible. The exceeding knowledge of the man on the spot, pitted against the great want of knowledge on the part of the man at home, has sometimes contributed, I have no doubt, to the man on the spot getting his way. I do not recommend it as a principle, and, speaking seriously, I would say that want of geographical knowledge at home is the thing most to be guarded against. But there is another danger in undue concentration of knowledge. In some cases you find that for the time being the hub of the universe is situated in some particular portion of the globe of which little has been heard before. Then I think is the time to consult large maps—not merely a large map of the district in question, but a large map which shows the proportion of that district to the continent in which it resides. At the Foreign Office we are compelled to study geography in detail. Twenty years ago I remember I had to learn most carefully the geography of the whole of the river called Mekong—a river which I have no doubt is familiar to all of you. Lately I have been much occupied with the names of five or six places on the frontiers of Albania, which are also no doubt so familiar that I need not refer to them. But though we need a right perspective and a due sense of proportion in dealing with geographical matters there is no doubt whatever that to-day more than ever—not to extend the Empire, but to retain the Empire—accurate, sound, thorough geographical knowledge, whether abroad or at home, is one of the essential foundations of success.

So much for the utilitarian point of view. The romantic point of view of foreign travel still remains. It is quite true that large portions of the Globe no longer have the same mystery attaching to them that they had when we were young. The sources of the Nile are no longer mysterious. The particular source which used to be hopelessly sought for has now not only been discovered, but domesticated; and

so with the greater part of Africa. And when we come to places like the Poles, the mystery may be less, but I think the romance is greater than ever. I will not trench upon the next toast by referring to the exploits and achievements which have been made by the United States. They have come home to all of us. And lately there has been a tragedy in connection with the South Pole which has brought home to us the fact that though the Poles have been visited they have not been conquered. I suppose they never will be. The South Pole will be for all of us ever associated with the record of human suffering, endurance, fortitude, and heroism of which we have lately had such pathetic and stimulating accounts. If the mystery is less, the romance, the tragedy, and the awe which attach to those great expeditions are not less, but greater. If it is no longer impossible to visit the Poles it is a rare and a difficult thing to accomplish that feat and to live. The imagination of mankind can still be stirred, their hearts made to glow, and their courage stimulated by the feats of travellers to the inhabitable and uninhabitable parts of the earth. The romance and fascination of travel remain, and on the other side it is as essential as ever that the knowledge that can only be acquired by travel, should be at the service of those who have to guide the development and care for the defence of an Empire.

Major Leonard Darwin: In rising to propose the toast of "Polar Exploration," I feel that a task of peculiar difficulty has been imposed on me, because the geographical year which has been brought to a conclusion to-day has been a year of many events and disasters both in the South and the North. On a suitable occasion it might be right to consider the causes of each particular catastrophe, though it would be utterly futile to hope to find a remedy which would have prevented them all. Such immunity could only have been obtained by means of an international agreement placing both polar regions out of bounds, as it were, as regards exploration; and I am glad to think that any such craven conspiracy in favour of ignorance would have been bound to fail. The danger had to be faced, and the meaning of the word "danger" is that in the long run a heavy price must be paid for facing it. Death has been the price, but glory has been the reward. It is difficult for us, weighted with a load of personal sorrow, to realize the sensations which these recent events will create in the minds of our descendents; but if we think of it, I am sure that we shall see that the names of Captain Scott and the six other heroes, four belonging to his expedition, and two to the Australian party, will in future arouse mainly feelings of thankfulness and pride; thankfulness to the men who risked and lost their lives in the cause of knowledge; pride that records of their proceedings are engraved on the pages of our national history. In fact, my Lord, this is an occasion, not for counting our losses but for counting our gains as regards polar exploration, which have been great indeed. Certainly, in welcoming Commander Evans and his gallant companions, so many of whom we are glad to see sitting at this table, the main thought in our minds is the splendid harvest of scientific results which they have brought; a crop, the quality of which we know, though it has not yet been fully threshed out and garnered. Much of the same thoughts fill our minds when we see Captain Davis, of the Australian Expedition; only in his case we must add our hearty good wishes that he will succeed in raising the additional funds necessary for that admirable expedition.

It is, however, not for me to count these polar gains in detail, for I am no expert in these matters. Nor is it necessary, at a dinner of the Royal Geographical Society, to show how the great white spaces round the poles on our maps have been covered with a network of recorded fact. Though much remains to be done, yet it may be truly said that the poles have delivered up their main secrets, a result due to a great international co-operation or rivalry, call it what you will—a rivalry which has

resulted in the Stars and Stripes being planted at the North Pole, and the Norwegian flag and the Union Jack at the South Pole. Time forbids me mentioning any polar explorers, even the recent ones, by name. You will, however, wish me, in your name, to give a word of greeting to Captain Gerlache, the Commander of the Belgian Antarctic Exploration, one of the earliest of the modern group of explorers. Then we cannot but regret that Lieut. Filchner, of the German Antarctic Expedition, was at the last moment prevented from attending this dinner; for we should like to have had the opportunity of thanking his countrymen through him for the many expressions of sympathy which they recently sent us, and of warmly reciprocating those sentiments with regard to the German disasters in Spitsbergen. Each one of the nations taking part in this simultaneous attack on these frozen regions has, I believe, honestly wished their rivals success; though, if the truth be told, each one must hope that their own countrymen may be the prize-winners. Looking to the future, at this moment, naturally our warmest wishes go out to the Canadian Expedition; an expedition which, we are glad to note, has been joined by our friend Captain Bartlett, the companion of Admiral Peary in his great Northern journey.

It is also, I think, natural that, putting aside British expeditions, there is no country in whose explorations we are so keenly interested as the United States; and I am always glad to think that it fell to my lot to send, as your President, a telegram of congratulation to Admiral Peary on his return from the North Pole. I must confess, however, that at that time my mind was a good deal perturbed by the eccentric behaviour of another American explorer. I have said I am no expert in these matters; but I shall sit down with the knowledge that I am to be followed by one who is not only a leading expert, but a renowned explorer. I shall, therefore, say no more, beyond coupling this toast with the name of General Greely, and asking him to let his countrymen know with what keen interest we watch their geographical achievements.

General Greely responded. He said that the greatest benefit which the world derived from the enormous aggregation of individuals in such a city as London, unequalled in the world, was the association of men of like ideas and interests, and among the many associations which had made London and Great Britain famous throughout the world, none had surpassed the Royal Geographical Society in its interests, its objects, and its successes. Greater than the commercial side of exploration were the spirit and aims which had actuated explorers and the moral influence which they had exercised.

Viscount Milner: In proposing the toast of "The Society and the President," I should like to congratulate the Society upon two things. One is the undoubtedly increased popular regard for the science which it represents. Sir Edward Grey truly said that knowledge, scientific or other, had not much to do with the acquisition of an Empire. I entirely agree with him in that; but no doubt it has everything to do with the retention of one, and for that reason, among others, science in this country is coming into greater honour, knowledge is more regarded than it was, and you, as the great representatives of geographical knowledge, have obtained a greater popularity than of yore. But beyond this, undoubtedly, a great deal must be attributed to the fact that the Royal Geographical Society has succeeded in a quite exceptional way in making itself the admitted and universally recognized national representative of the science for which it works. That has been due, no doubt, to a great number of distinguished men who have belonged to it in the past. Perhaps none of them has done more to add to its prestige and effectiveness than has Lord Curzon, your President. Lord Curzon has told us that he was not able to explain why so many eminent men had been attracted to the gatherings of this Society. The circumstance may not,

perhaps, be so difficult of explanation to those who are acquainted with the peculiar gifts of Lord Curzon himself in enlisting support for the causes which he has at heart. Lord Curzon's compelling power has shown itself in many ways, and especially in the skill which he so conspicuously possesses of bringing home to us our duty to those causes in a financial sense. These are invaluable gifts in the President of an association like this, and the Royal Geographical Society has greatly profited by them, especially in connection with its migration to its new home.

Earl CURZON: In reply to what Lord Milner has said in regard to this toast, let me say that I would sooner it were proposed by him than by any living man. There has been no more consistent, sincere, or successful advocate of what I may call Imperial geography than Lord Milner. His whole life has been given to the service of the Empire, and he has performed not the last, I hope, and certainly not the least, of these services in the book which he has recently given to the public. If the Royal Geographical Society had any superfluous funds to expend, which for the moment it has not, I would undertake the free distribution to every Fellow of the Society of the book on Empire which Lord Milner has just published. It is a magnificent record of principles fearlessly advocated, and unflinchingly held, the successful maintenance of which is vital to the preservation of our Empire.

RESEARCH MEETING.

June 4, 1913.—Sir DAVID GILL, K.C.B., F.R.S., in the Chair.

The paper read was:—

"The Magnetic Survey of the Oceans." By Prof. R. A. Bauer.

Sixteenth Meeting, June 9, 1912.—DOUGLAS W. FRESHFIELD, Esq., Vice-President, in the Chair.

ELECTIONS.—*G. B. Allen; Henry Armitstead; Miles H. Atkinson, M.D.; General Sir Edmund Barrow, G.C.B.; Major Kennedy Beresford (late Royal Irish Rifles); Mrs. Jex-Blake; Henry Joseph Boam; Major the Hon. W. G. S. Cadogan (10th Royal Hussars); Lord Chelmsford; Francis Drake; William Shirley Draycote; The Hon. Mrs. Dawtrey Drewitt; Thomas Leslie Evans; Patrick F. Foran; Roy G. Glenday; Captain George Dominic Heyland, I.A.; Miss Hunt Holley; Thomas Cann Hughes; Miss Ethel Laidlaw; Mrs. Constance Larymore; Sir Walter Lawrence, Bart.; Sir Bryan B. M. Leighton, Bart.; Frederick Lisman; Major C. de J. Luxmoore; Douglas Mawson, D.Sc.; George Berry Milligan; Ralph Neville; Douglas Hedley Oliver, B.Sc.; Miss Euphemia Dickson Park; Ernest Guy Ridpath; Captain William Ross-Brown; Captain George Herbert Synes, D.S.O.; William Andrew Tinnock; Andre Uzel; Mrs. Clarence Watson.*

The paper read was:

"Across Southern Jubaland to the Lorian Swamp." By I. N. Dracopoli.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By EDWARD HEAWOOD, M.A., *Librarian*, R.G.S.

The following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Abh. = Abhandlungen.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Col. = Colonies.
Com. = Commerce.
C.R. = Comptes Rendus.
E. = Erdkunde.
G. = Geography, Géographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
Iz. = Izvestiya.
J. = Journal.
Jb. = Jahrbuch.
Jber. = Jahresbericht.
k.k. = kaiserlich und königlich.
M. = Mitteilungen.
Mag. = Magazine.
Mem. (Mém.) = Memoirs, Mémoires.
Met. (mét.) = Meteorological.
P. = Proceedings.
R. = Royal.
Rev. = (Riv.) = Review, Revue, Rivista.
S. = Society, Société, Selskab.
Sc. = Science(s).
Sitzb. = Sitzungsbericht.
T. = Transactions.
Ts. = Tijdschrift, Tidskrift.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.
Zap. = Zapiski.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

A selection of the works in this list will be noticed elsewhere in the "Journal."

EUROPE.

Denmark—Geology. **Bonnesen, Bøggild, and Ravn.**

Carlsbergfondets Dybdeboring i Grøndals Eng ved København 1894–1907 og dens videnskabelige Resultater. Ved E. P. Bonnesen, O. B. Bøggild og J. P. J. Ravn. Copenhagen: Bianco Luno, 1913. Size 10½ × 8½, pp. 106. *Illustrations. Presented by the Carlsberg Fund.*

France—Rouen. **Levainville.**

J. Levainville. Rouen: étude d'une agglomeration urbaine. Paris: A. Colin, 1913. Size 9 × 5½, pp. 418. *Map, Plan, and Illustrations. Price 7 fr. 50. Presented by the Publisher.*

Germany—Baden. **Werner.**

Die Entwicklung der Kartographie Südbadens im 16. und 17. Jahrhundert. Von Dr. Johannes Werner. (Abhandlungen zur badischen Erdkunde; herausgegeben von L. Neumann und Alfred Hettner; 1 Heft.) Karlsruhe: G. Braun, 1913. Size 9 × 6, pp. viii. and 64. *Facsimile maps. Price M.3.20. Presented by the Publisher.*

Italy—Sicily. **Riggs.**

Vistas in Sicily. By Arthur Stanley Riggs. New York: McBride, Nast & Co., 1912. Size 7½ × 5, pp. xii. and 272. *Illustrations. Price* $1.10 *net. Presented by the Author.*

Norway—Nordfjord. *Bergens Museums Aarbok*, 1912, No. 3, pp. 152. **Kaldhol.**

Nordfjords kvartæravleiringer. Av H. Kaldhol. *Maps, Illustrations, and Sections.*

On terraces, moraines, etc., on the shores of the Nord fjord (north of Bergen).

Prussia—Black Sea coast. *Iz. Imp. Russ. G.S.* **48** (1912): 1–22. **Voeikoff.**

Travels on the Coast of the Black Sea during the summer of 1911. By A. Voeikoff. [In Russian.]

Russia—Kola peninsula. **Kozhevnikoff.**

Zap. Milit. Topogr. Sect. General Staff **66**, Sect. 1 (1911): 151–156.

Special survey of the Murman coast, north-east shore of the Kola peninsula, in 1906–1908. By Captain Kozhevnikoff. *Map.* [In Russian.]

Russia—Olonetz. *Iz. Imp. Russ. G.S.* **48** (1912): 225–279. **Piotrovski and von Ditmar.**
Limnology of the Petrozavodsk district, government of Olonetz. By V. F. Piotrovski and B. P. von Ditmar. *Map and Illustrations.* [In Russian.]

Russia—Surveys. **Svintzeff.**
Zap. Milit.-Topogr. Sect. General Staff **64**, Sect. 2 (1912): 72–122.
Geodetic and astronomical connection between Schlüsselburg and New Ladoga. By Captain Svintzeff. *Map, Plan, Sections, and Illustrations.* [In Russian.]

Russia—Surveys. ——
Zap. Milit.-Topogr. Sect. General Staff **64**, Sect. 2 (1912 *sic*): 157–346; **65**, Sect. 2; (1910): 261–405; **66**, Sect. 2 (1911): 287–447.
Reports on geodetic work, executed by officers of the triangulation on the western frontier in 1905–1908. (Livonia, Volhynia, Finland, Libau fortress, Vitebsk, Minsk, and Kieff regions.) *Sketch-maps.* [In Russian.]

Scandinavia—Climate and vegetation. **Frödin.**
Arkiv för Botanik **11** (1912): No. 12, pp. 74.
Tvenne västskandinaviska klimatfaktorer och deras växtgeografiska betydelse. Af John Frödin. *Illustrations.*

Spain—Altitudes. *R.S.G. Madrid, Rev. G. Col.* **9** (1912): 301–304. **Briet and Prudent.**
Levantamientos hipsometricos en el alto Aragón. Resultado de observaciones hechas con barómetro por Luciano Briet y calculadas por el Ten.-Col. Prudent.

Spain—Historical. *B.R.S.G. Madrid* **54** (1912): 433–469. **Blázquez.**
Los griegos en España. Estudios geográficos, por Antonio Blázquez.

Sweden, Central—Settlement. **Högbom.**
Ymer: Ts. Svenska S. Antropologi och G. **32** (1912): 253–301.
Studier öfver Upplands äldre bebyggelsehistoria. Af A. G. Högbom. *Map.*

Sweden—Geomorphology. **Stolpe.**
En Sydsvensk israndslinie och dess geografiske betydelse. Af Per Stolpe. Göteborg, 1911. Size 10 × 7, pp. 58. *Maps and Illustrations.*

Sweden—Hydrology. **Wallen.**
Ymer; Ts. Svenska S. Antropologi och G. **32** (1912): 144–180.
Sveriges vattenområden och deras hydrografiska undersökning. Af Axel Wallén. *Maps and Diagrams.*

Sweden—Lapland—Snow-phenomena. **Hamberg.**
K. Svenska Vet.-A. Årsbok (1912): 225–303.
Om skare och flen i Lappland. Af H. E. Hamberg.
On the surface crust of frozen snow and allied phenomena.

Sweden—Place-name. **Nordlander.**
Ymer: Ts. Svenska S. Antropologi och G. **32** (1912): 302–307.
Om flodnamnet "Ljungan." Af J. Nordlander. *Sketch-map.*
On the derivation of the name.

Turkey. **Duncan-Johnstone.**
With the British Red Cross in Turkey: the experiences of two volunteers, 1912–13. By A. Duncan-Johnstone. London: J. Nisbet & Co., 1913. Size 9 × 5½, pp. viii. and 198. *Illustrations. Price 5s. net. Presented by the Publishers.*

Turkey—Macedonia. *National G. Mag.* **23** (1912): 1118–1132. **Villari.**
The races and religions of Macedonia. By Luigi Villari. *Illustrations.*

United Kingdom—Coasts. **Reid.**
Submerged forests. By Clement Reid. Cambridge: University Press, 1913. Size 7 × 5, pp. vi. and 130. *Price 1s. Presented by the Publishers.*

United Kingdom—Derbyshire. **Moss.**
Vegetation of the Peak district. By C. E. Moss. Cambridge: University Press, 1913. Size 9 × 5½, pp. x. and 236. *Maps and Illustrations. Price 12s. net. Presented by the Publishers.*

United Kingdom—Lincolnshire. **Sympson.**

Lincolnshire. By E. Mansel Sympson. (Cambridge County Geographies; edited by Dr. F. H. H. Guillemard.) Cambridge: University Press, 1913. Size 7½ × 5, pp. viii. and 184. *Maps, Illustrations, and Diagrams. Price* 1*s.* 6*d. Presented by the Publishers.*

United Kingdom—Middlesex. **Hampstead Scientific Society.**

Hampstead Heath; its geology and natural history. Prepared under the auspices of the Hampstead Scientific Society. London: T. Fisher Unwin, 1913. Size 9 × 6, pp. 328. *Maps and Illustrations. Price* 10*s.* 6*d. net. Presented by the Publisher.*

ASIA.

China—Shensi. **Keyte.**

The passing of the dragon: the story of the Shensi revolution and relief expedition. By J. C. Keyte. London: Hodder & Stoughton. (1913). Size 8½ × 5½, pp. xii. and 312. *Sketch-map and Illustrations. Price* 6*s. Presented by the Publishers.*

China—Yunnan. **Service Géologique Indo-Chine.**

Mémoires du Service Géologique de l'Indo-Chine; vol. 1, fascicules 1–3. Étude géologique du Yun-nan Oriental. Par J. Deprat et H. Mansuy. Hanoi-Haiphong, 1912. Size 15 × 11, pp. (Fasc. 1) xiv. and 370; (Fasc. 2) 148; (Fasc. 3) 78. *Sketch-maps and Illustrations; also separate Atlas (accompanying Fasc.* 1*) of Maps and Sections. Presented by the Service Géologique de l'Indo-Chine Français.*

Chinese Empire—Railway. *Mouvement G.* **29** (1912): 577–580. ———.

A travers la Chine, de la mer à la frontière du Thibet. La construction d'une grande voie 2000 kilomètres de longueur concédée à une société belge. *Sketch-map.*

Chinese Empire—Tibet. **Hedin.**

Trans-Himalaya: Discoveries and adventures in Tibet. By Sven Hedin. Vol. 3. London: Macmillan & Co., 1913. Size 9 × 6, pp. xv. and 426. *Maps and Illustrations. Price* 15*s. net. Presented by the Author.*

French Indo-China—Geology. **Service Géologique Indo-Chine.**

Mémoires du Service Géologique de l'Indo-Chine. Vol. 1, fascicule 4. Mission du Laos. Par H. Mansuy. Contribution à la géologie du Tonkin. (By the same.) Hanoi-Haiphong, 1912. Size 15 × 11, pp. 82. *Map and Illustrations.*

India—Assam. **Lorrain.**

Five years in unknown jungles for God and Empire; being an account of the founding of the Lakher Pioneer Mission. By Reginald A. Lorrain. London: Lakher Pioneer Mission, [1912]. Size 8 × 5, pp. xii. and 274. *Sketch-map and Illustrations. Presented by the Author.*

India—Burma. **Dautremer.**

Burma under British rule. By Joseph Dautremer. Translated and with an introduction by Sir George Scott. London: T. Fisher Unwin, [1913]. Size 9 × 6, pp. 392. *Illustrations. Price* 15*s. net. Presented by the Publisher.*

India—Delhi. *J. East India Ass.* **4** (1913): 1–30. **Havell.**

The building of the new Delhi. By E. B. Havell.

India—Delhi. *J.R.S. Arts* **61** (1912): 133–148. **Leslie.**

Delhi, the metropolis of India. By Sir Bradford Leslie. *Plan.*

India—Himalaya. *B.S.G. Italiana* **1** (1912): 819–840, 947–967. **Paganini.**

Rilievi fotogrammetrici nelle regione del Karakoram eseguiti dalla spedizione di S. A. R. il Duca degli Abruzzi. Di Pio Paganini. *Map.*

India—Himalaya—Garhwal. *Alpine J.* **26** (1912): 434–437. **Meade.**

A note on the Garhwal Himalaya, 1912. By C. F. Meade. *Illustrations.*

India—Historical. **Foster.**

The English factories in India, 1642–1645. A calendar of documents in the India Office, Westminster. By William Foster. Oxford: Clarendon Press, 1913. Size 9 × 6, pp. xxxviii. and 340. *Sketch-map. Price* 12*s.* 6*d. net. Presented by the Publishers.*

India—Madras—Harbour. *Min. of P.I. Civil Engineers* **190** (1912): 89–129. **Spring.**

The remodelling and equipment of Madras Harbour. By Sir Francis J. E. Spring. *Sections, Illustrations, and Diagrams.*

India—North-West Frontier—Swat river. **Molesworth.**
R. Engineers J. 17 (1913): 67–76.

Training works in the Swat river. By Captain F. C. Molesworth. *Plans and Illustrations.*

Malay Archipelago—Celebes—Volcanoes. **Koperberg.**
P.R.A. W. Amsterdam 14 (1911–12): 222–237, 399–419.

Notes on the Sopoetan Mountains in the Minahassa. By M. Koperberg. *Sketch-map.*

Malay Archipelago—Coral. *P.R.A. Amsterdam* 14 (1912): 698–711. **Wichmann.**

On the so-called atolls of the East Indian Archipelago. By Prof. A. Wichmann. *Illustrations.*

Malay Archipelago—Timor. *Philippine J. Sc.* 7 (1912): A., 283–288. **Adams.**

Timor island: its supposed volcano and its probable tectonic relations. By George I. Adams. *Sketch-map.*

See note in the April number, p. 385.

Malay States—Survey. **Jackson.**

Federated Malay States. Report on Survey Department for the year 1911. By Colonel H. M. Jackson, Surveyor-General. Kuala Lumpur, 1912. Size 13 × 8½, pp. 34. *Maps.*

Persia. *Iz. Imp. Russ. G.S.* 47 (1911): 461–482. **Trubetzkoi.**

Journey on the river Karun and across the Baktiari mountains. By Prince P. S. Trubetzkoi. [In Russian.]

Philippine Islands—Luzon—Geology. **Fanning.**
Philippine J. Sc. 7 (1912): A., 255–282.

Geologic reconnaissance of North-Western Pangasinan. By Paul R. Fanning. *Maps, Plans, Illustrations, and Section.*

Philippine Islands—Sugar. **Nesom and Walker.**

Handbook on the sugar industry of the Philippine islands. In two parts. By G. E. Nesom and Herbert S. Walker and others. Part I. The sugar industry of the Philippine islands. Part II. The sugar industry in the island of Negros. Manila, 1912. Size 10 × 7, pp. 146. *Sketch-maps and Illustrations. Presented by the Bureau of Agriculture.*

Turkey—Syria. **Lukach.**

The fringe of the East: a journey through past and present provinces of Turkey. By Harry Charles Lukach. London: Macmillan & Co., 1913. Size 9 × 5½, pp. xiii. and 273. *Sketch-map and Illustrations. Price* 12*s. net. Presented by the Publishers.*

AFRICA.

Abyssinia—Historical. **Beccari.**

Rerum Æthiopicarum scriptores occidentales inediti a sæculo xvi. ad xix., curante C. Beccari. Vol. 12, Relationes et epistolæ variorum, Pars I. Liber 3. Rome: C. de Luigi, 1913. Size 10½ × 7, pp. xvi. and 602. *Facsimile Map and Illustration. Price* 20*s.* 8*d.*

Eritrea. **Martini and others.**

L'Eritrea economica. Da Ferdinando Martini e a. (Biblioteca Geografica dell' Istituto Geografico De Agostini, N. 1.) Rome: Istituto Geografico De Agostini, 1913. Size 10 × 7, pp. xvi. and 544. *Maps and Illustrations. Price Lire* 16. *Presented by the Publishers.*

Italian Somaliland. **Onor**
Minist. Col. (*Italia*); *Monografie e Rapporti Col.*, 1913; No. 1, pp. 64.

Appunti di agricoltura benadiriana: relazione del Dott. Romolo Onor. *Illustrations and Diagram.*

Italian Somaliland—Surveys. **Istituto Geografico-Militare.**
Minist. Col.: Rapporti e Monografie Col., No. 25 (1912): pp. 54.

Relazione sui lavori compiuti in Somalia dal giugno 1910 al giugno 1912, a cura dell' Istituto Geografico Militare. *Map and Illustrations.*

Kamerun. **Zimmerman.**

Neu-Kamerun: Reiseerlebnisse und wirtschaftspolitische Untersuchungen. Von Emil Zimmermann. Berlin: E. S. Mittler u. Sohn, 1913. Size 9½ × 6, pp. viii. and 136. *Sketch-map. Price M.* 4.

Madagascar—Hydrography. **Roussilhe and others.**
Ann. Hydrographiques (2 Sér.) **30** (1908–1910): 141–278.
Mission hydrographique de Madagascar. Rapport de M. Roussilhe (1904–1905). Rapport de M. Lesage (Rance, November, 1905–November, 1906). Rapport de M. Courtier (Rance, November, 1906—November, 1907). *Maps, Illustrations, and Diagrams.*

Morocco—Historical. *B.S.R.G. d'Anvers* **36** (1912): 5–24. **Donnet.**
Anvers et le Maroc au XVI^e^ siècle. Par Fernand Donnet.

Morocco—Tamlelt. *B.S.G. Oran* **31** (1911): 553–559. **Rey.**
La haute plains du Tamlelt. Par Lieutenant Rey. *Map and Sections.*
In Eastern Morocco, south-west of the Shott Tigri.

Morocco—Treaty. *L'Afrique Française* **23** (1913): 12–15. **Caix.**
Le traité Franco-Espagnol. Par Robert de Caix.

Nigeria—Disease. **Graham.**
Report on Blackwater Fever in Southern Nigeria, 1899–1911. By W. M. Graham. London, 1912. Size 13 × 8, pp. 72. *Sketch-map, Diagrams, and Illustrations. Presented by the Crown Agent for the Colonies.*

Nigeria—Folk-lore. **Dayrell.**
Ikom folk-stories from Southern Nigeria. By E. Dayrell. (Royal Anthropological Institute, Occasional papers, No. 3, 1913.) London, 1913. Size 11 × 7½, pp. viii. and 102. *Illustrations.*

Nigeria—Language. **Robinson.**
Dictionary of the Hausa language. By Dr. Charles Henry Robinson. Vol. 1. 3rd edit. Cambridge: University Press, 1913. Size 8 × 5, pp. xiv. and 426. *Price* 12*s. net. Presented by the Publishers.*

Nyasaland—Cotton. *B. Imperial I.* **10** (1912): 527–536. ——
The Cotton industry of Nyasaland.

Portuguese East Africa—Lourenço Marques. ——
The Delagoa Directory 1913. A Year-Book of Information regarding the town and port of Lourenço Marques. Lourenço Marques: A. W. Bayly & Co., 1913. Size 8½ × 5½, pp. 174. *Presented by the Editor.*

Portuguese West Africa. **Almeida.**
João de Almeida. Sul d'Angola: relatorio de um governo de distrito (1908–1910). Lisbon: Typ. do Annuario Commercial, 1912. Size 11½ × 8, pp. xx. and 648. *Maps, Illustrations, and Diagrams. Presented by the Ministry of Colonies, Lisbon.*

Rhodesia—Administration. **Rolin.**
Les lois et l'administration de la Rhodésie. Par Henri Rolin. Brussels: E. Bruylant, 1913. Size 10 × 6½, pp. xlviii. and 532. *Maps and Illustrations. Presented by the Author.*

Rhodesia—Ethnology. *P. Rhodesia Sc. Assoc.* **11** (1911–12): 140–150. **Hall.**
Antiquity of the Bushman occupation of Rhodesia. By R. N. Hall. *Illustrations.*

South Africa—Tongas. **Junod.**
The life of a South African tribe. By Henri A. Junod. Vol. 2, The psychic life. London: Macmillan & Co., 1913. Size 6 × 6, pp. 574. *Illustrations. Price (each vol.)* 15*s. net. Presented by the Publishers.*
The first volume appeared in 1912 (*Journal*, vol. 40, p. 579). The two are sold separately.

Transvaal—Geology. **Mines Department.**
Union of South Africa. Mines Department. Report of the Geological Survey (Transvaal) for the year 1911. Pretoria, 1912. Size 11 × 8½, pp. 114. *Maps, Sections, and Illustrations. Presented by the Mines Department.*

West Africa—Ethnology. **Tessmann.**
Die Pangwe; völkerkundliche Monographie eines westafrikanischen Negerstammes. Ergebnisse der Lübecker Pangwe-Expedition 1907–1909 und früherer Forschungen 1904–1907. Von Günter Tessmann. 1 Band. Berlin: E. G. Wasmuth, 1913. Size 11½ × 8, pp. xxii. and 276. *Maps and Illustrations. Price* 13*s.* 6*d.*

NORTH AMERICA.

Labrador. **Grenfell.**

Labrador: the country and the people. By Wilfred T. Grenfell. New edit. New York (London: Macmillan & Co.), 1913. Size 8 × 5½, pp. xii. and 530. *Maps and Illustrations. Price* 10*s.* 6*d. net. Presented by the Publishers.*

United States—Arid region—Erosion. *J. Geology* **20** (1912): 442–450. **Paige.**

Rock-cut surfaces in the desert ranges. By Sidney Paige. *Sketch-maps and Sections.*

United States—California—Ethnology. **Mason.**

Univ. California Publ., American Archæology, etc. **10** (1912): 97–206.

The ethnology of the Salinan Indians. By J. Alden Mason. *Illustrations.*

United States—California—Geology. **Baker.**

Univ. California Publ., B. Geology **7** (1912): 117–142.

Physiography and structure of the Western El Paso Range and the Southern Sierra Nevada. By Charles Laurence Baker. *Illustrations.*

United States—Cartography. *B. American G.S.* **44** (1912): 838–844. **Joerg.**

Development and state of progress of the United States portion of the International Map of the World. By W. L. G. Joerg. *Map.*

See Monthly Record, April, p. 388.

United States—Colorado—Glacial epochs. **Atwood and Mather.**

J. Geology **20** (1912): 385–409.

The evidence of three distinct glacial epochs in the pleistocene history of the San Juan Mountains, Colorado. By Wallace W. Atwood and Kirtley F. Mather. *Sketch-maps.*

United States—Florida. *B.S.G. Philadelphia* **10** (1912): 235–245. **Harshberger.**

South Florida. A geographic reconnaissance. By Dr. John W. Harshberger. *Illustrations.*

United States—Lake Michigan. **Bormann.**

Monthly Weather Rev. **40** (1912): 1334–1335.

Seiches in lower Lake Michigan in May, 1912. By W. R. Bormann. *Diagrams.*

United States—Mississippi. *B. Pan American Union* **35** (1912): 939–949. **Barr.**

A water power of world-wide effects. By G. Walker Barr. *Illustrations.*

See Monthly Record, April, p. 389.

CENTRAL AND SOUTH AMERICA.

Peru—Historical. **Cieza de Leon and Markham.**

The war of Quito, by Pedro de Cieza de Leon; and Inca documents. Translated and edited by Sir Clements R. Markham, K.C.B. (Works issued by the Hakluyt Society, Second Series, No. 31.) London, 1913. Size 9 × 5½, pp. xii. and 212. *Purchased.*

South America. **O'Halloran.**

A bibliography of South America. Compiled by T. P. O'Halloran. Buenos Aires (London: T. Fisher Unwin), 1912. Size 8½ × 5½, pp. 56. *Price* 1*s.*

West Indies—Haiti—Seismology. **Scherer.**

B. Seismological S. America **2** (1912): 230–232.

Notes on remarkable earthquake sounds in Haiti. By J. Scherer.

See note in the April number, p. 389.

AUSTRALASIA AND PACIFIC ISLANDS.

Australasia—Exploration. **Johnston.**

Pioneers in Australasia. By Sir Harry Johnston. London: Blackie & Son, 1913 [1912]. Size 8½ × 5½, pp. 308. *Sketch-maps and Illustrations. Price* 6*s. Presented by the Publishers.*

New Guinea, German. **Thilenius and others.**

Hamburgische Wissenschaftliche Stiftung. Ergebnisse der Südsee-Expedition, 1908–1910. Herausgegeben von Prof. Dr. G. Thilenius. II. Ethnographie; A. Melanesien. Bd. 1. Der Kaiserin-Augusta-Fluss. Von Dr. Otto Reche. Hamburg: L. Friederichsen & Co., 1913. Size 12½ × 9, pp. x. and 488. *Maps and Illustrations. Price M.*48.

New Guinea and Solomon Islands. **Meek.**

A naturalist in cannibal land. By A. S. Meek. London: T. Fisher Unwin, [1913]. Size 9 × 5½, pp. xviii. and 238. *Sketch-map and Illustrations. Price* 10*s.* 6*d. Presented by the Publisher.*

New Zealand—Auckland. **Baughan.**

Uncanny country. By B. E. Baughan. Christchurch, [1912]. Size 8 × 5, pp. 56. *Illustrations. Presented by the Author.*

New Zealand—Taranaki—Geology. **Clarke.**

New Zealand. Department of Mines. Geological Survey Branch, Bulletin No. 14 (New Series). The geology of the New Plymouth Subdivision, Taranaki division. By Edward de Courcy Clarke. Wellington, 1912. Size 11 × 8½, pp. vi. and 58. *Maps.*

Pacific—Historical. *K. Svenska Vet.-A. Arsbok*, 1912: 341–387. **Dahlgren.**

Om den franska handeln i Stilla oceanen under åren närmast efter freden i Utrecht. Af E. W. Dahlgren.

Continues the author's interesting studies of the early French enterprise in the Pacific.

Queensland—Labour. *P.R. Philosoph. S. Glasgow* **43** (1911–12): 182–194. **Gregory.**

The employment of white labour in the sugar plantations of Queensland. By Prof. J. W. Gregory.

POLAR REGIONS.

Arctic. **Balch.**

The North Pole and Bradley Land. By Edwin Swift Balch. Philadelphia: Campion & Co., 1913. Size 10½ × 7, pp. 92. *Sketch-map. Presented by the Author.*

Greenland. **Amdrup.**

Danmarks-Ekspeditionen til Grønlands Nordøstkyst 1906–1908. Bind I., Nr. 1. Report on the Denmark Expedition to the North-East Coast of Greenland, 1906–1908. By G. Amdrup. Copenhagen: Bianco Luno, 1913. Size 11 × 7, pp. 270. *Maps and Portraits. Presented by the Author.*

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Cartography. **Hinks.**

Maps and Survey. By Arthur R. Hinks. Cambridge: University Press, 1913. Size 9 × 5½, pp xvi. and 206. *Maps and Illustrations. Price* 6*s. net. Presented by the Publishers.*

PHYSICAL AND BIOLOGICAL GEOGRAPHY.

Geophysics. *C.R.A. Sc. Paris* **155** (1912): 1198–1200. **Berget.**

Le rôle magnétique des océans et la constitution de l'écorce terrestre. Par Alphonse Berget. *Diagram.*

Geophysics. **Bowie.**

Department of Commerce and Labor. Coast and Geodetic Survey. Geodesy. Special Publication No. 12. Effect of topography and isostatic compensation upon the intensity of gravity. (Second paper.) By William Bowie. Washington, 1912. Size 11 × 9, pp. 28. *Maps.*

Hydrology. **Binnie.**

Rainfall reservoirs and water supply. By Sir Alexander R. Binnie. London: Constable & Co., 1913. Size 9 × 5½, pp. xii. and 158. *Plans, Illustrations, and Diagrams. Price* 8*s.* 6*d. net. Presented by the Publishers.*

Oceanography—Mediterranean. **Schmidt.**

Report on the Danish Oceanographical Expeditions, 1908–1910, to the Mediterranean and adjacent seas. Published . . . under the superintendence of Dr. Johs. Schmidt. Vol. 1. Copenhagen: A. F. Host & Son, 1912. Size 13½ × 11, pp. iv. and 270. *Maps, Illustrations, and Diagrams. Presented by the Publishers.*

Phytogeography. **Hardy.**

The Oxford Geographies; edited by A. J. Herbertson. An introduction to plant-geography. By Dr. M. E. Hardy. Oxford: Clarendon Press, 1913. Size 7½ × 5, pp. 192. *Sketch-maps and Illustrations. Price* 2*s.* 6*d. Presented by the Publishers.*

ANTHROPOLOGICAL AND HISTORICAL GEOGRAPHY.

Medical Geography—Beriberi. **Strong and Crowell.**

Philippine J. Sc. 7 (1912): B, 271–422.

The etiology of beriberi. By Richard P. Strong and B. C. Crowell. *Plan, Diagrams, and Illustrations.*

GENERAL.

Education. **Tarr and Engeln.**

A laboratory manual of physical and commercial geography. By Ralph S. Tarr and O. D. von Engeln. New York (London: Macmillan & Co.), 1913. Size 10½ × 8½, pp. xiii. and 214. *Maps and Diagrams. Price 3s. 6d. net. Presented by the Publishers.*

Education—Exercises. **Dudley.**

Deductive exercises in geography: Europe. By Cyril R. Dudley. London: G. Philip & Son, 1913. Size 8½ × 6½, pp. 62. *Sketch-maps. Price 1s. Presented by the Publishers.*

Education—Text-book. **Herbertson.**

A handbook of geography. By Dr. A. J. Herbertson. Vol. 2. London: T. Nelson & Sons, (1912). Size 7½ × 5, pp. xvi. and 682. *Sketch-maps and Diagrams. Price 4s. 6d. Presented by the Publishers.*

Year-book. **Keltie and Epstein.**

The Statesman's Year-Book: statistical and historical annual of the States of the World for the year 1913. Edited by Dr. J. Scott Keltie and Dr. M. Epstein. London; Macmillan & Co., 1913. Size 7½ × 5, pp. xcvi. and 1452. *Maps and Diagrams. Price 10s. 6d. net. Presented by the Publishers.*

NEW MAPS.

By E. A. REEVES, *Map Curator*, R.G.S.

EUROPE.

Austria. **Adrian and Trunk.**

Handkarte des Herzogtums Salzburg. Bearbeitet von Karl Adrian. Scale 1 : 400,000 or 1 inch to 6·3 stat. miles. Handkarte des politischen Bezirkes Korneuberg. Scale 1 : 150,000 or 1 inch to 2·4 stat. miles. Schulhandkarte des Herzogtums Steiermark. Bearbeitet von Hans Trunk. Scale 1 : 600,000 or 1 inch to 9·5 stat. miles. Vienna: G. Freytag & Berndt, [1913]. *Presented by the Publishers.*

Relief is shown on these three maps by the special system of colour tints combined with shading which has for some time past been adopted by the publishers in maps of this kind. In this the attempt is made to follow, as far as practicable, the colours of the spectrum, ranging from blue and bluish-greens for low lands through yellow and orange to red for the highest lands. Although somewhat over-coloured, the effect is graphic, and the relief is certainly well brought out by the tints selected.

British Isles—England and Wales. **Ordnance Survey.**

Sheets published by the Director-General of the Ordnance Survey, from May 1 to 31, 1913.

6-mile map.

Large sheet series; printed in colours and folded in cover or flat in sheets. Sheets 7, 8, 9. *Price on paper, 1s. 6d.; mounted on linen, 2s.; mounted in sections, 2s. 6d.*

1-inch map.

Third edition, engraved in outline. Sheets 66, 67. *Price 1s. each.*

6-inch maps:—

Revised. Quarter-sheets, with contours in black, blue, or red. *Price 1s. each.*

Berkshire, 13 sheets. **Cheshire**, 4 sheets. **Lancashire**, 4 sheets. **Sussex**, 3 sheets. **Yorkshire**, 4 sheets.

1 : 2500 scale maps:—

Revised, with houses stippled, and with areas. *Price 3s. each.*

Berkshire, 1 sheet. **Carnarvonshire**, 4 sheets. **Denbighshire**, 16 sheets. **Flintshire**, 4 sheets. **Lancashire**, 14 sheets. **Middlesex**, 5 sheets. **Oxfordshire**, 3 sheets. **Surrey**, 3 sheets. **Yorkshire**, 8 sheets.

NOTE.—There are no coloured editions of these sheets.

(*E. Stanford, Ltd., London Agents.*)

British Isles—England. **Gross.**

Road Map of Kent. By Alexander Gross. Scale 1 : 126,720 or 1 inch to 2 stat. miles.—Road map of 30 miles round London. By Alexander Gross. Scale 1 : 126,720 or 1 inch to 2 stat. miles. London: Geographia, Ltd., [1913]. *Price, mounted on cloth and cut to fold, 3s. 6d. net each. Presented by the Publishers.*

These maps, intended specially for motorists and cyclists, show main roads in red, considerably exaggerated in breadth, with the steepness of the gradient indicated in red figures. Railways are in black, and an index to places appears at the side. The map of Kent also includes a considerable extent of the adjacent counties of Surrey and Sussex. They are mounted and folded for pocket use.

British Isles—London. **Moore.**

A Prospect and Map of London, showing the River Thames to Woolwich Reach; drawn by Jonas Moore in 1662. From the original in the possession of His Majesty's Office of Works. London: London Topographical Society, 1912.

Consists of a plan extending from Westminster to Woolwich, with a panoramic view of London on the top and another of Greenwich at the bottom, from an original in the possession of H.M. Office of Works. The London Topographical Society have done well to publish a facsimile of this interesting old drawing.

British Isles—Scotland. **Bartholomew.**

Bartholomew's Motoring and Cycling Maps. Scale 1 : 126,720 or 1 inch to 2 stat. miles. Edinburgh District. Glasgow District. Edinburgh: John Bartholomew & Co., [1913]. *Price 1s. net each sheet. Presented by the Publishers.*

Two maps, mounted and folded for the pocket, showing roads in brown and relief by colour tints on the layer system, according to Messrs. Bartholomew's well-known clear style.

France. **Ministre de l'Intérieur, Paris.**

Carte de la France dressée par ordre der Ministre de l'Intérieur. Scale 1 : 100,000 or 1 inch to 1·6 stat. miles. Sheets: xii.–20, Ile de Noirmoutier (Nord); xii.–16, Le Mans (Nord); xii.–28, Coutras; xiii.–38, Val d'Arouge; xiv.–14, Verneuil; xix.–22, Moulins (Est); xx.–23, Charolles; xxi.–20, Beaune (Ouest); xxii.–35, Martigues; xxiv.–16, Darney. New editions: Paris; Hachette & Cie., 1913. *Price 0.80 fr. each sheet.*

Germany. **K. Sachs. Generalstab.**

Karte des Deutschen Reiches. Königreich Sachsen. Herausgegeben von der Abteilung für Landesaufnahme des Königl. Sächs. Generalstabes. Scale 1 : 100,000 or 1 inch to 1·6 stat. miles. Kupferdruck Ausgabe. Sheet 441. Altenburg. Dresden: G. A. Kaufmann, 1913. *Price 1.50 M. each sheet.*

Germany. **Vogel.**

Karte des Deutschen Reiches und der Alpenländer im Massstab. 1 : 500,000 (1 inch to 7·9 stat. miles) unter Redaktion von Dr. C. Vogel. Sheet 29, Wein. Gotha: Justus Perthes, [1913].

A sheet of a new edition of a map which was first published in 1891.

Iceland. **Generalstabens Topografiske Afdeling, Copenhagen.**

Generalstabens Topografiske Kort over Island. Scale 1 : 50,000 or 1·3 inch to 1 stat. mile. Sheets: 13 S.A., Bardaströnd; 14 N.A., Breidifjördur; 23 S.V., S.A., Gufudalur; 24 N.V., N.A., S.V., S.A., Fellströnd; 25 N.A., Hnappadalur; 33 S.V., Ospakseyri; 35 N.V., S.V., Nordurardalur. Copenhagen: Generalstabens Topografiske Afdeling, 1913. *Presented by the Chief of the Danish General Staff.*

Italy. **De Agostini.**

Provincia di Alessandria (*Price 0.60 Lire*); Provincia di Milano (*Price 0.50 Lire*); Provincia de Padova (*Price 0.50 Lire*); Provincia de Torino (*Price 1.20 Lire*). Scale 1 : 250,000 or 1 inch to 3·9 stat. miles. Novara; Istituto Geografico De Agostini, 1913. *Presented by the Publishers.*

Italy. **Leoni.**

Leonida Leoni. Testo-Atlante delle Ferrovie e Tramvie Italiane e di quelle estere in contratto Francia, Svizzera ed Austria-Ungheria. Prefazione dell' Ing. Pietro Lanino. Novara: Istituto Geografico De Agostini, 1913. *Price 5 Lire. Presented by the Publishers.*

A pocket atlas consisting of thirty plates of maps and ninety pages of statistical text, giving full information concerning Italian railways. For the sake of the connections, the adjacent countries of France, Switzerland, and Austria-Hungary, are also included, and alphabetical lists of stations appear at the end.

Russia. **Freytag and Peucker.**

Generalkarte von West-Russland und den angrenzenden Landern bis Wien und Budapest. Entworfen und gezeichnet von G. Freytag. Bearbeitet von Dr. K. Peucker. Scale 1: 1,500,000, or 1 inch to 23·6 stat. miles. Vienna: Artaria & Co., 1913. *Price 1.50 M. Presented by the Publishers.*

Russia. **Peucker.**

Die Eisenbahnen des Europäischen Russland mit Teilen der angrenzenden Länder und Kleinasiens. Bearbeitet von Dr. Karl Peucker. Scale 1: 6,000,000 or 1 inch to 94·7 stat. miles. Vienna: Artaria & Co., [1913]. *Presented by the Publishers.*

Russia. **Peucker.**

Politische Uebersichtskarte des Europäischen Russland mit Tabellen politisch-statistischer Verhältnisse. Bearbeitet von Dr. Karl Peucker. Scale 1: 6,000,000 or 1 inch to 94·7 stat. miles. Vienna: Artaria & Co., 1913. *Presented by the Publishers.*

ASIA.

China—Dzungaria. **Obrucheff.**

Maps of Western Dzungaria, scales 1: 400,000 (1 inch to 6·3 stat. miles) and 1: 500,000 (1 inch to 7·9 stat. miles), by Sergieff Obrucheff. Tomsk, 1912. *Presented by the Author.*

Two route-maps showing the journeys and explorations of the author in Central Asia between the years 1905 and 1909. Sheet I. extends from 45° 10′ to 47° N. lat. and 82° 20′ to 86° E. long.; and Sheet II. from 44° 40′ to 47° 40′ N. lat. and 81° 30′ to 86° 40′ E. long. The regions included have been hitherto but imperfectly known, and these maps are consequently of special importance. The maps are to accompany the author's account of his explorations in his recent book 'Das Grenzgebiet der Dsungarei.'

Tonking. **Sérvice Geographique de l'Indo-Chine.**

Carte du Delta du Tonkin. Scale 1: 25,000 or 2·5 inches to 1 stat. mile. Sheets: 74, Lôi-Duong; 75, Thanh-Hóa. Hanoi: Service Géographique de l'Indo-Chine, 1904. *Price 1 piastre each sheet.*

AFRICA.

Algeria. **Gouvernement Général de l'Algérie.**

Département d'Oran. Carte des Voies de Communication dressée par ordre de M. Ch. Lutaud, Gouverneur-Général. Scale 1: 400,000 or 1 inch to 6·3 stat. miles. Algiers: Gouvernement Général de l'Algérie, Direction de l'Agriculture, du Commerce et de la Colonisation, Service Cartographique, 1913.

An outline map showing roads and railway systems in red and black lines and symbols, with distances in kilometres in figures along the lines. Dotted lines indicate lines under construction.

Egypt. **Egyptian Survey Department.**

Map of Egypt. Scale 1: 250,000 or 1 inch to 3·9 stat. miles. Sheets: 1 E, North-West Delta; 1 F, North-East Delta; 2 E, South-West Delta; 2 F, South-East Delta; 3 E, Fayum; 3 F, El Saf. Giza: Survey Department, 1912. *Presented by the Director-General, Egyptian Survey Department.*

Six sheets of a map now in course of publication, reduced, by the photo-metal process, from the 1: 50,000 scale. They include the whole of the delta, and will be useful for general reference. Information as to breadth of canals and drains, means of communication, wells, and other matters is given by symbols, and heights are in metres.

Egypt. **Egyptian Survey Department.**

Topographical map of Egypt. Scale 1 : 10,000 or 6·3 inches to 1 stat. mile. Sheet: N.W. 19–6, 20–5, 20–6, 21–4, 21–6, 21–10, 21–14, 21–16, 22–6, 22–9, 22–10, 22–14, 22–15, 22–17, 23–5, 23–6, 23–7, 23–10, 23–11, 23–12, 23–13, 23–14, 23–15, 23–17, 23–18, 23–19, 24–5, 24–11, 24–12, 24–13, 24–14, 24–15, 24–16, 24–17, 24–18, 24–19, 25–5, 25–12, 25–14, 25–15, 25–17, 25–18, 25–20, 26–14, 26–15, 26–16, 26–17, 26–18, 26–19, 26–20, 27–13, 27–14, 27–15, 27–16, 27–17, 27–18, 27–19, 28–16, 28–17, 28–18, 29–8, 29–10, 29–11, 29–13, 29–17, 28–18, 29–20, 30–10, 30–11, 30–13, 30–15, 30–16, 30–17, 30–18, 30–20, 31–12, 31–13, 31–14, 31–15, 31–16, 31–17, 32–10, 32–12, 32–15, 32–16, 32–17, 32–18, 33–10, 33–12, 33–14, 33–15, 33–16, 33–19, 33–20, 34–10, 34–12, 34–13, 34–14, 34–15, 34–19, 35–12, 35–13, 35–14, 36–13, 36–14, 37–13, 37–14, 38–13, 38–14, Mudiria Beheira. Giza: Survey Department, 1913. *Presented by the Director-General, Egyptian Survey Department.*

Egyptian Sudan. **Survey Department, Khartum.**

Map of the Egyptian Sudan. Compiled at the Survey Office, Khartum. Scale 1 : 250,000 or 1 inch to 3·9 stat. miles. Sheets: 45–K, Atbara; 45–L, Adarama; 45–N, Shabluka; 45–O, Shendi; 55–N, Jebelein; 65–L, [Bahr-el-Homr]; 66–N, Middle Sobat; 78–B, Khor Geni; 78–F, Bor; 78–J, Mongalla; 78–O, Oboya. Khartum: Survey Office, 1912–13. *Price* 10 *P.T. each sheet. Presented by the Director of Surveys, Khartum.*

Kamerun. **Moisel.**

Karte von Kamerun bearbeitet von M. Moisel. Scale 1 : 300,000 or 1 inch to 4·7 stat. miles. Sheets: A 4, Tschad; B 3, Dikoa; C 3, Mubi. Berlin: Dietrich Reimer (Ernst Vohsen), 1912–13. *Presented by the Publishers.*

Nigeria, Southern. **Guggisberg.**

Southern Nigeria. Scale 1 : 125,000 or 1 inch to 1·9 stat. miles. Published by authority of Sir Frederick Lugard, G.C.M.G., C.B., D.S.O., Governor, under the direction of Major F. G. Guggisberg, C.M.G., R.E., Director of Surveys, Southern Nigeria, and Captain R. H. Rowe, R.A., Deputy Director, Topographical Branch. Sheets: North B 31–OIV, Meko; (Provisional Series), North C 31–UIV, Akande. Edinburgh and London: W. & A. K. Johnston, Ltd., 1913. *Price* 1*s.* 6*d. each sheet. Presented by the Publishers.*

South Africa. **Bartholomew.**

The Standard Commercial and Educational Map of the Union of South Africa and Southern Rhodesia. Scale 1 : 2,500,000 or 1 inch to 39·4 stat. miles. Specially compiled and published for the Standard Publishing Co. of South Africa, Johannesburg, [1913]. *Price* 21*s. Presented by Messrs. John Bartholomew & Co.*

A general coloured map of South Africa south of lat. 15° 30′ S., without hill-shading. Special attention has been paid to railways and roads, which are clearly shown. Plans of principal ports are given as insets, and there is an index to town names.

Tunis. **Direction Générale des Travaux Publics, Tunis.**

*Carte des Routes et des Chemins de Fer de la Tunisie au 1er Janvier 1912, dressée par la Direction Générale des Travaux Publics. Scale 1 : 500,000 or 1 inch to 7·89 stat. miles. Tunis: J. Picard & Cie., 1912.

A new edition of a map showing railways, roads, tracks, lighthouses, etc., up to January 1, 1912, with an enlarged plan of the environs of Tunis.

AMERICA.

Canada. **Dept. of the Interior, Ottawa.**

Sectional Map of Canada. Scale 1 : 190,080 or 1 inch to 3 stat. miles. Sheets: 10, Port Moody, revised to January 8, 1913; 111, Kamloops, revised to May 14, 1912; 366, Saddle Lake, revised to January 13, 1913. Ottawa: Department of the Interior, 1912–13. *Presented by the Department of the Interior.*

Canada. **Dept. of Mines, Geological Survey, Ottawa.**

Map 40A. Bighorn Coal Basin between Saskatchewan and Brazeau rivers, Alberta. Map 50A, Part of Portland Canal Mining Area, British Columbia. Scale 1 : 125,000 or 1·014 inches to 2 stat. miles. Ottawa: Department of Mines, Geological Survey, 1911. *Presented by the Dept. of Mines, Geological Survey, Ottawa.*

AUSTRALIA.

Australia. **Hunt.**

Rain Map of Australia for the year 1912. Scale 1 : 8,300,000 or 1 inch to 130·9 stat. miles. Prepared under instructions from the Honourable King O'Malley, M.P.

Minister of State for Home Affairs, by H. A. Hunt, Commonwealth Meteorologist. Melbourne: Central Weather Bureau, 1913. *Presented by the High Commissioner for Australia.*

Australia. **Hunt.**

Commonwealth Meteorology. Australia and Tasmania. Revised Average Annual Rainfall Map. Mean Monthly Rainfall Maps. Average Yearly Temperature Map. Mean Monthly Temperature Maps. Published by Authority, under the direction of H. A. Hunt, Commonwealth Meteorologist. Melbourne: Central Weather Bureau, 1912. *Presented by the High Commissioner for Australia.*

ATLANTIC OCEAN AND ISLANDS.

Madeira. **Zeigler.**

Physical Map of the Island of Madeira. Constructed by J. M. Zeigler. New edition, revised. Scale 1: 100,000 or 1 inch to 1·6 stat. mile. London: Edward Stanford, Ltd., [1913]. *Price 5s.*

This is a new edition of a map that was first published in 1855. Relief is well shown by shading, and by means of various symbols and colours, vineyards, forests of various kinds, heaths, cultivated lands, upper limits of wheat and rye, and other information are given. It will doubtless be useful to tourists and others visiting the island.

GENERAL.

World. **Kiepert.**

Henrici Kiepert: Formae Orbis Antiqui. 86 Karten mit kritischem Text und Quellenangabe. Bearbeitet und herausgegeben von Richard Kiepert. XXV. Gallia secundo et tertio p. Chr. n. saeculo. Berlin: Dietrich Reimer (Ernst Vohsen), [1912]. *Price 3M. each sheet.*

An important map showing the provinces, roads, numerous place-names, and other information from the most recent historical researches. Explanatory text, with a list of authorities consulted, is given in the same portfolio with the map.

CHARTS.

Admiralty Charts. **Hydrographic Department, Admiralty.**

Charts and Plans published by the Hydrographic Department, Admiralty, from May 4 to 31, 1913. *Presented by the Hydrographer, Admiralty.*

New Charts—1577, Scotland, west coast: Western approaches to the Firth of Clyde, 3*s*. 1690, Newfoundland: Hawke bay to Ste. Geneviève bay, including St. John bay (Plans: St. John Harbour, Good bay), 3*s*. 91, Plans on the west coast of Morocco: Arzila, Larache, Rabat and Salé, 3*s*. 1173, Africa, west coast: Grand Butu point to Great Nifu (Plan: King Wills bay), 3*s*. 3423, Africa, west coast: Calabar river (Plans: Duke Town anchorage, Akwavafe river), 5*s*. 1316, Korea: Suon kutchi (Cape Duroch) to Kokko kutchii (Linden point) (Plans: Chanjindon anchorage, Sŏho jin, Toe cho kei and approaches, Shinchan bay, Chaho bay, Iihō anchorage, Karumaho, Peijin bay, Odechin bay, Chonjin or Chung chin bay), 3*s*. 1369, Bay of Bengal: Mayu river to Kyauk Pyu harbour, 3*s*. 3350, China, Yang tse kiang: The Poyang lake (Plans: Chang kiang and Loan kiang, Kan kiang to Nien yu tan, Ning kiang above Changc hun hsien), 3*s*. 1970, New Zealand: Auckland harbour and approaches (Plans: Calliope dock and approaches, Auckland wharves), 4*s*. 585, Plans in British Columbia: Baker passage, Blubber bay, Marble bay and Van Anda cove, Pender harbour, Shoal channel and Plumper cove, Port Graves, 3*s*. **New Edition of Charts**—2045, England, south coast: Owers to Christchurch, with Spithead and the Isle of Wight, 5*s*. 2631*a*, England, south coast: Portsmouth harbour, upper part, 5*s*. 1182, England, west coast: Cardiff and Barry roads with approaches, 4*s*. 1828, England, east coast: The Downs, 4*s*. 1468, Ireland, east coast: Wicklow to Skerries islands, with Dublin bay, 3*s*. 1549, Ireland: The Shannon, Sheet 5; Foynes to Middle ground, 3*s*. 1540, Ireland: The Shannon, Sheet 7: Scarlet reach to Limerick, 3*s*. 1406, North sea: Dover and Calais to Orfordness and Scheveningen, 3*s*. 3685, Norway, west coast: Lofotodden to Ure, 3*s*. 2670, North America, east coast: Halifax to the Delaware, 3*s*. 1806, Africa, west coast: Great Fish bay to Walfisch bay, 3*s*. 734, Red sea: Suez bay, 3*s*. 361, China sea: Tambelan islands (Plan: Tambelan creek), 3*s*. 2349, Australia, east coast: Magnetic island to Double point, 3*s*. 3507, Japan, Yezo: Mororan ko, 2*s*. 3650, Japan, Nipon: Toba ko, 2*s*. 613, Australia, north coast: Melville island, with Dundas and Clarence straits, 3*s*. 1061, Australia, south coast: Cape Catastrophe to the Great Australian bight (Plans: Port Eyre, Denial and Smoky bays, Streaky bay, Coffin bay, Waterloo bay); Plan added:

Venus harbour (Port Kenny), 4s. 2034, North America, east coast: Northumberland strait, Plan added: Crapaud road, 4s.
(*J. D. Potter, Agent.*)

Atlantic. **U.S. Hydrographic Office.**

Pilot chart of the North Atlantic Ocean, May, 1913; ditto, South Atlantic Ocean, June, July, August, 1913. Washington: U.S. Hydrographic Office, 1913. *Presented by the U.S. Hydrographic Office.*

Atlantic. **U.S. Weather Bureau.**

Meteorological charts of the North Atlantic Ocean, June and July, 1913; ditto, South Atlantic Ocean, June, July, August, 1913. Washington: Department of Agriculture, U.S. Weather Bureau, 1913. *Presented by the U.S. Weather Bureau.*

Burma. **Hunton and Smith.**

Rangoon river. Harbour limits to North D'Silva Point. Surveyed August to October, 1912, by A. S. Hunton, River Surveyor, and V. G. Smith, Asst. River Surveyor, under the direction of H. N. Gilbert, Offg. Deputy-Conservator of the Port. Scale 1 : 12,102 or 5·2 inches to 1 stat. mile. Rangoon: Commissioners for the Port, 1913. *Presented by the Deputy Conservator of the Port, Rangoon.*

Indian Ocean. **U.S. Hydrographic Office.**

Pilot chart of the Indian Ocean, June, 1913. Washington: U.S. Hydrographic Office, 1913. *Presented by the U.S. Hydrographic Office.*

Indian Ocean. **U.S. Weather Bureau.**

Meteorological chart of the Indian Ocean, June and July, 1913. Washington: Department of Agriculture, U.S. Weather Bureau, 1913. *Presented by the U.S. Weather Bureau.*

North America—Great Lakes. **U.S. Weather Bureau.**

Meteorological charts of the Great Lakes, June and July, 1913. Washington: Department of Agriculture, U.S. Weather Bureau, 1913. *Presented by the U.S. Weather Bureau.*

Pacific. **U.S. Hydrographic Office.**

Pilot chart of the North Pacific Ocean, June, 1913; ditto, South Pacific Ocean, June, July, August, 1913. Washington: U.S. Hydrographic Office, 1913. *Presented by the U.S. Hydrographic Office.*

Pacific. **U.S. Weather Bureau.**

Meteorological chart of the North Pacific Ocean, June and July, 1913; ditto, South Pacific Ocean, June, July, August, 1913. Washington: Department of Agriculture, U.S. Weather Bureau, 1913. *Presented by the U.S. Weather Bureau.*

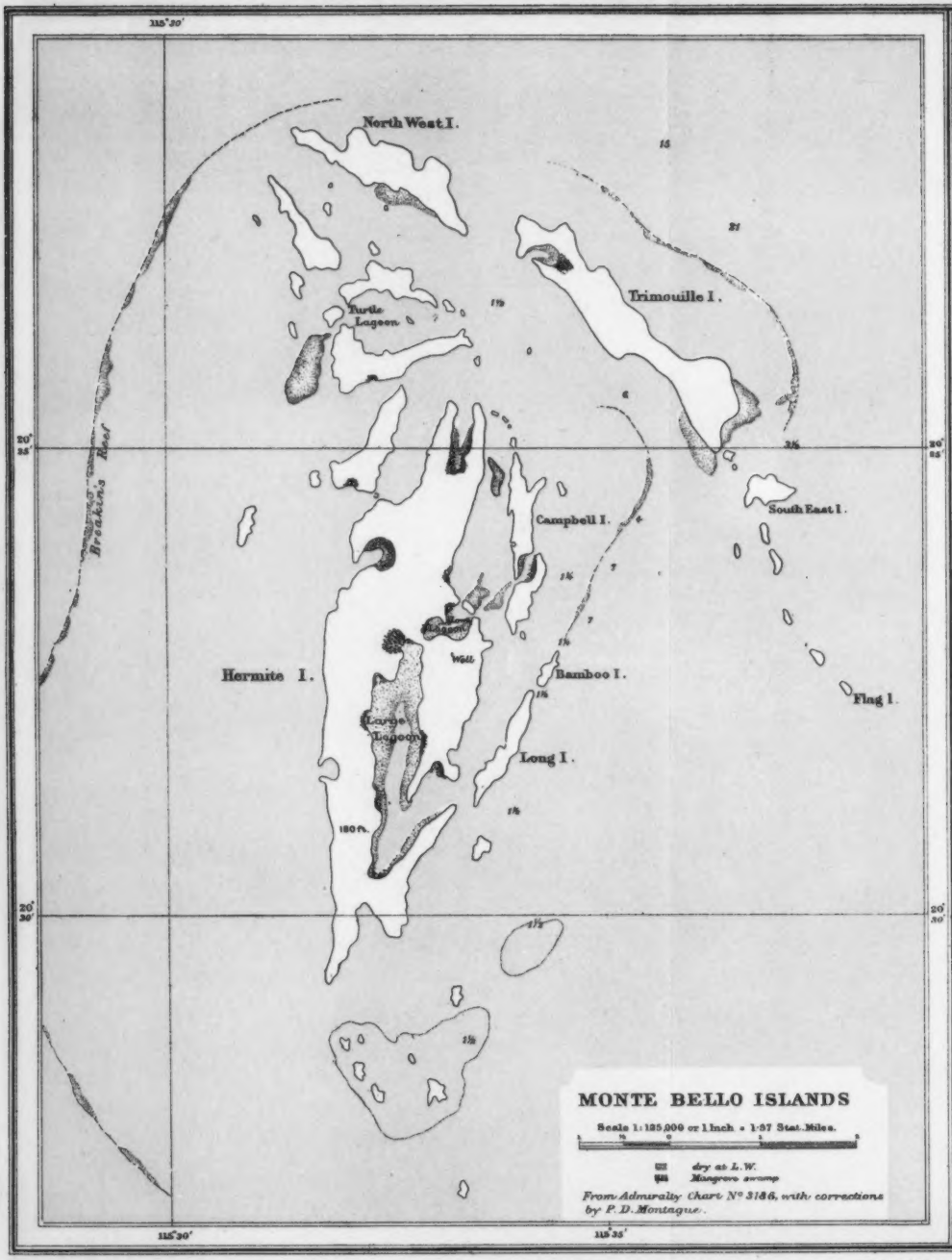
PHOTOGRAPHS.

British Isles. **Woodward and Sharpe.**

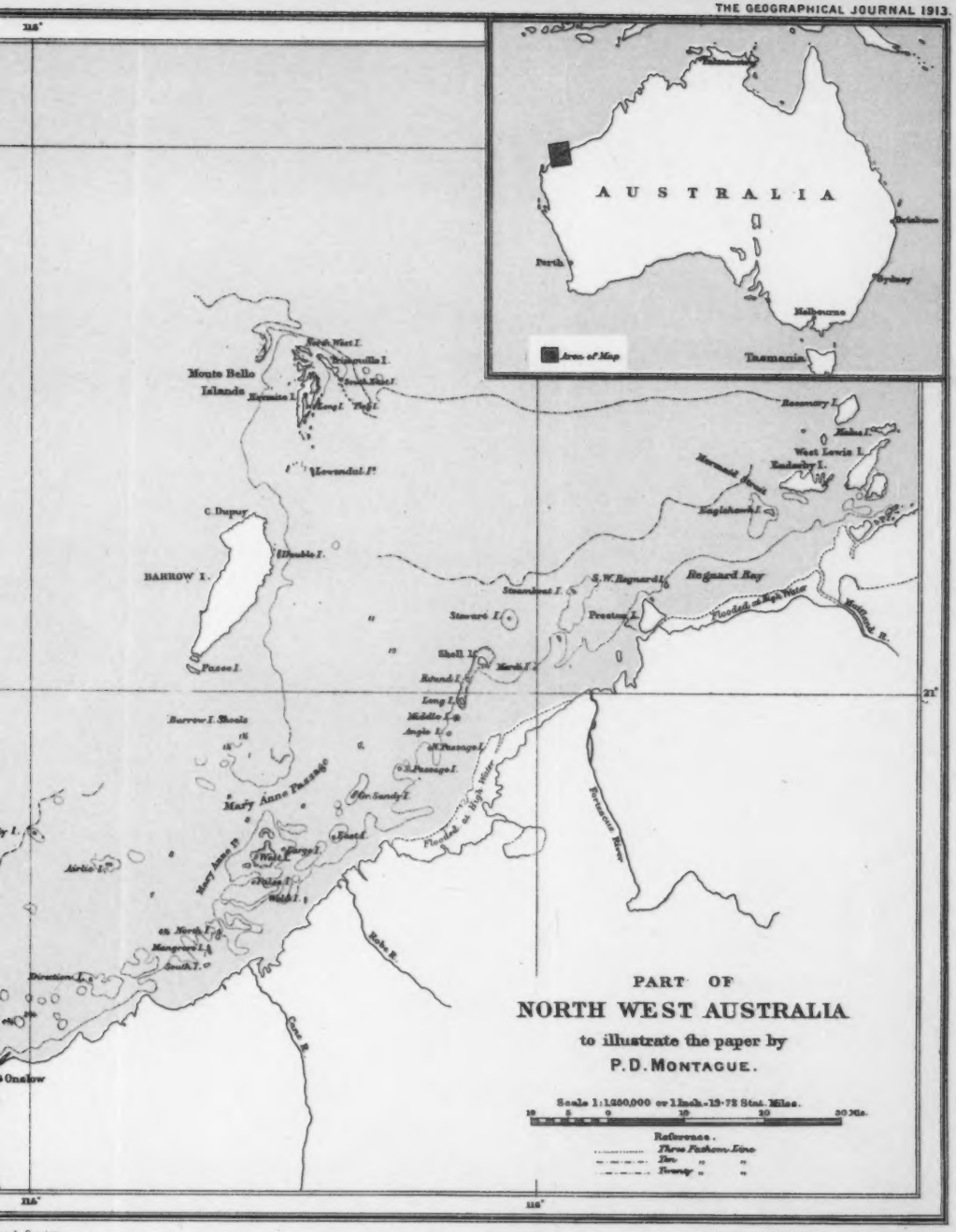
Photographic supplement of Stanford's Geological Atlas of Great Britain and Ireland. Arranged and edited by Horace B. Woodward, F.R.S., F.G.S., with the co-operation of Miss Hilda D. Sharpe. London: Edward Stanford, Ltd., 1913. *Price 4s. Presented by the Publishers.*

Contains a series of 108 excellent photographic reproductions illustrative of rock features and scenery of the principal formations of Britain. The arrangement is chronological so far as possible, in regard both to the stratified formations and those of igneous origin. The views are well chosen and characteristic, and each is accompanied by short explanatory letterpress. The work is intended as a companion to 'Stanford's Geological Atlas of Great Britain and Ireland,' and owes its inception to Miss Hilda D. Sharpe, who has furnished 44 of the illustrations personally or through friends. The names of all who have contributed photographs are given in a list at the commencement.

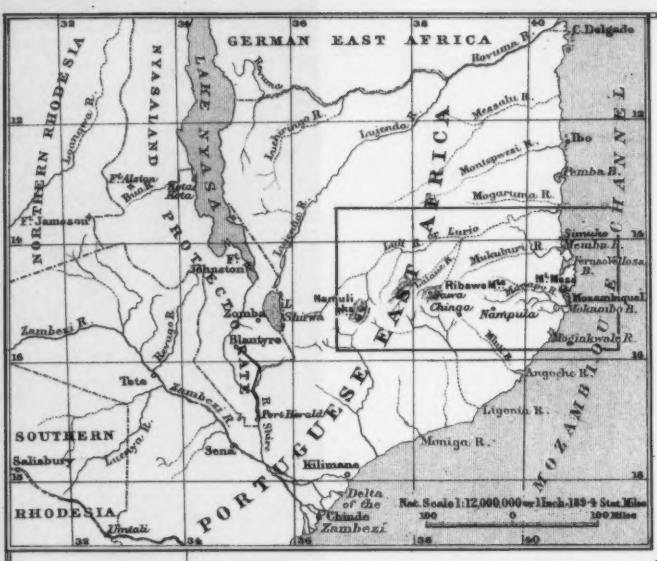
N.B.—It would greatly add to the value of the collection of Photographs which have been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.

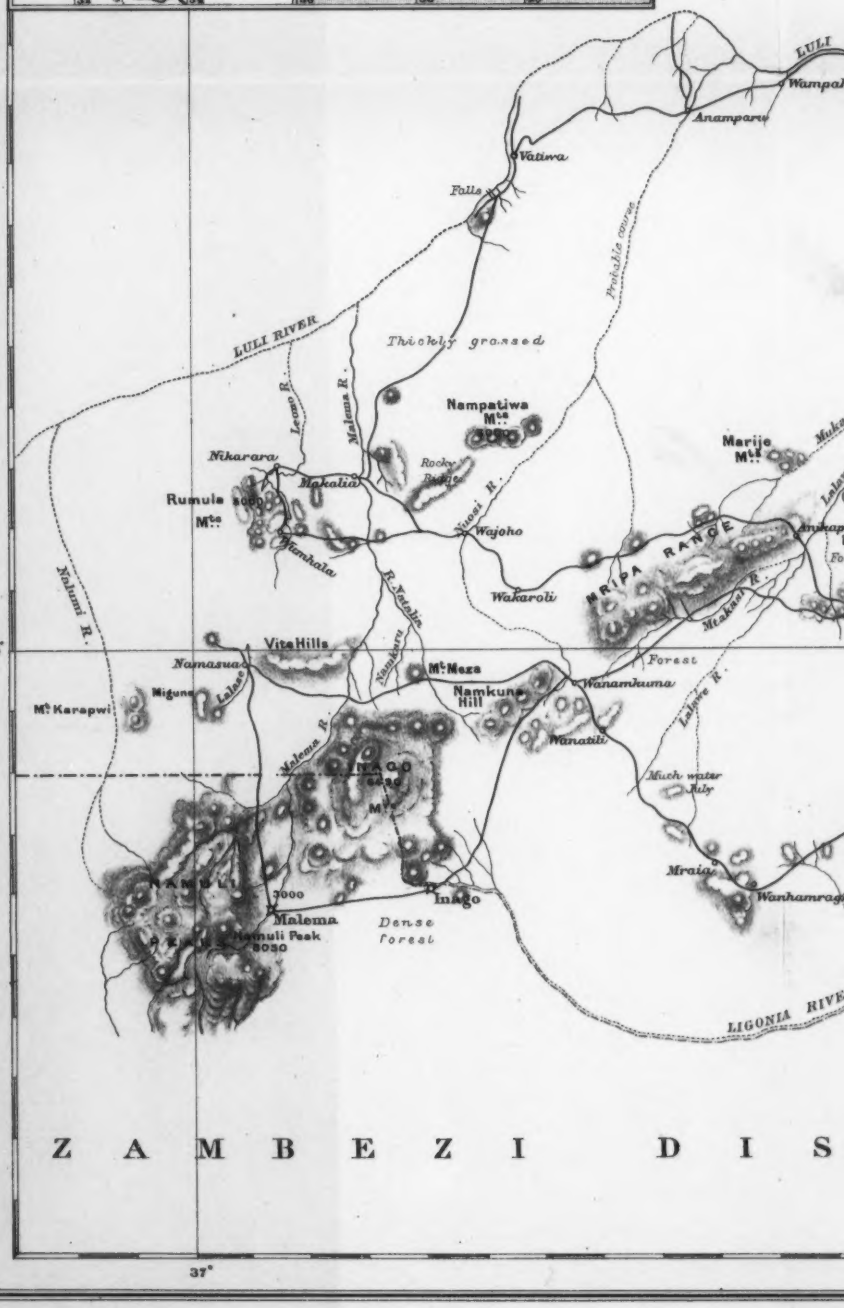


Published by the Royal Geographical Society


AUSTRALIA
Perth
Brisbane
Sydney
Melbourne
Tasmania
Area of Map
Monte Bello Islands
North West I.
Trimouille I.
South West I.
Hermite I.
Lowendal I.
C. Dupuy
BARROW I.
Passe I.
Rosemary I.
Hobart I.
West Lewis I.
Enderby I.
Montalivet Passage
Eaglehawk I.
Regnard Bay
S.W. Regnard I.
Steamboat I.
Stewart I.
Preston I.
Flooded at High Water
Wallaroo R.
Shell I.
North I.
Round I.
Long I.
Middle I.
Angle I.
N. Passage I.
S. Passage I.
Barrow I. Shoals
Mary Anne Passage
Mary Anne R.
Hovercraft Sandy I.
Flooded at High Water
Fortescue River
Airlie I.
Thevenard I.
Varys I.
Hook I.
Shaft I.
Spike I.
Wells I.
North I.
Mangrove I.
South I.
Direction I.
Onslow
Robe R.
Cane R.
21°
115°
PART OF
NORTH WEST AUSTRALIA
to illustrate the paper by
P. D. MONTAGUE.
Scale 1:1,250,000 or 1 Inch = 19·72 Stat. Miles.
10 5 0 10 20 30 Mls.
References.
Three Fathom Line
Ten " "
Twenty " "

oal Society.


GERMAN EAST AFRICA
NORTHERN RHODESIA
NYASALAND
LAKE NYASA
PROTECTORATE
PORTUGUESE EAST AFRICA
MOZAMBIQUE CHANNEL
SOUTHERN RHODESIA
C. Delgado
Ibo
Fernao Veloso B.
Mozambique
Angoche R.
Ligonia R.
Moniga R.
Sena
Tete
Zambesi R.
Shire R.
Kilimane
Delta of the Zambesi
Chinde
Umtali
Salisbury
Blantyre
Zomba
Fort Jameson
Fort Johnston
Lake Shirwa
Namuli Mts.
Mt. Mesa
Nat. Scale 1:12,000,000 or 1 Inch=189·4 Stat. Miles
100 0 100 Miles


LULI
Wampal
Anamparu
Vatiwa
Falls
Probable course
LULI RIVER
Thickly grassed
Nampatiwa
Nikarara
Rocky Ridge
Marije
Rumula
Makalia
Wajoho
MRIPA RANGE
Wakaroli
Nalumi R.
R. Vetobie
Vita Hills
Namasua
Mt. Meza
Forest
Mt. Karapwi
Namkuna Hill
Wanamkuma
Wanasili
Much water July
Inago
Malema
Dense forest
Namuli Peak
8030
Mraia
Wanhamrag
LIGONIA RIVE
15°
37°

Z A M B E Z I D I S

38° 39°

MOZAMBIQUE
PORTUGUESE EAST AFRICA

GEOGRAPHICAL RESULTS
OF THE
MEMBA MINERALS EXPEDITIONS
OF 1910 & 1911.

From the compass traverses of the exploring staff under the leadership of E.W.E. Barton. Adjusted to positions astronomically fixed by R.L. Reid.

Scale 1:1,000,000 or 1 Inch = 15·78 Stat. Miles.

10 5 0 10 20 30 40 50 Miles

Village of Native chief ○ *Military Roads* ——
Military Posts ⊠ *Do. with Telegraph* ——
Positions fixed by R.L. Reid ● *Expedition routes* ——

Probable course of the Zulu River
Mpilua
Mougaia
Wanamhala
LULI RIVER OR LURIO
Wampahua
Heavy grass
Mrupi
3000-5000 FT
Thickly populated
Namkoka
Muazia
Mukupuria
Hostile natives
Probable course of the Lalana River
Probable course of the Bua Bua River
Unexplored
Mt. Artigwi
Umpagi
Mt.
Mutti R.
MLULI MTS
3000
Namkola
Mt. Rube
Nyassi R.
RUMUBURI RIVER
Mukassi R.
Lalana R.
Wala R.
Mbulla Ra.
Erikola Hills
Kalowi Hills
Karji Hills
Wanarapa
Mulima
Wanantaliwa Range
Mkwassi R.
Kindar
RISAWE MTS
Ribawe Peak 3000 ft.
5000-6000 FT.
Kahar Hills
Mupu Mt.
Mt. Nipi
Mt. Pula
Amparawanini
Forest
Norrai Forest
Namloko
SAWA
Ribawe R.
Base Camp 1700
East Peak 2980
West Peak 3040
2000
Mavili Hills
Mt. Tahera
Mt. Mataria
Mt. Tipwi
CHIKA RANGE 4000
Chika 3600
Open forest grassed
High
Namista
Mt. Potara
Arunta
Swamp
Mt. Mushima
Chinga
Namista R.
Palalani H.
Poone H.
Mueleki R.
Plain 1500 ft.
Namuli R.
Natashu
Namahuga Range
3000
Lalana R.
Miwahi Hills
Udepe Hills
Arikwi Hills
Gila Hills
Kalima
Etopoli Hills
Murupula
Ligonia R.
Mote H.
Ngini R.
Ligonia
Alwaro
Maluga Hills
Nakota
Ndrupa R.
Mkisiwi R.
R. Ligonia R.
STRICT
Low Range
LIGONIA RIVER

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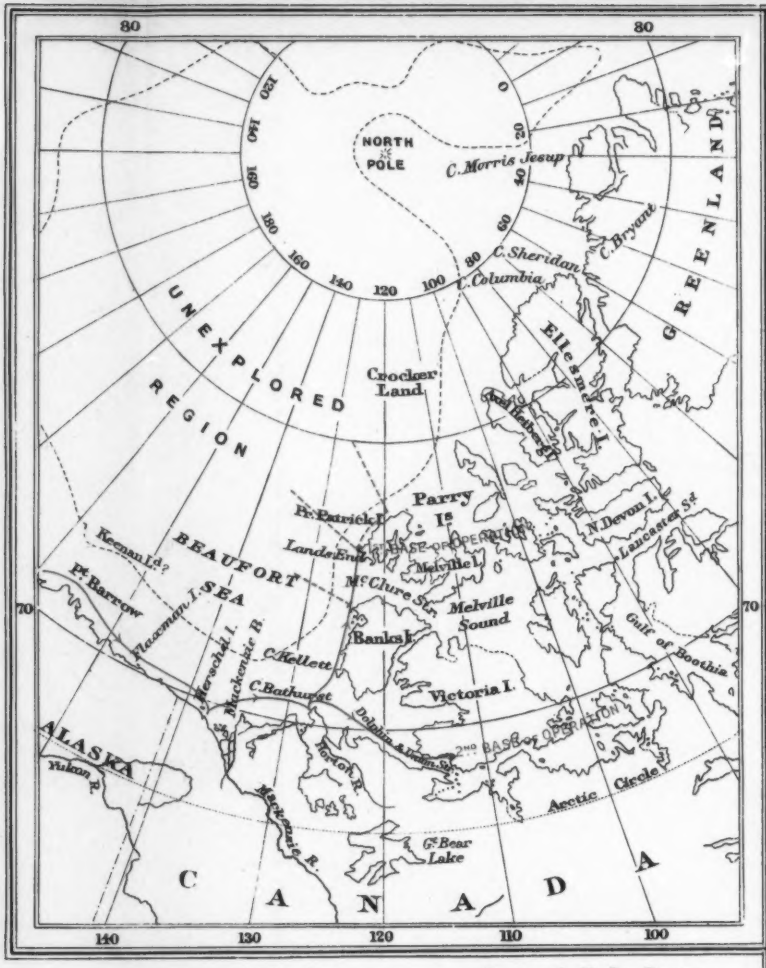
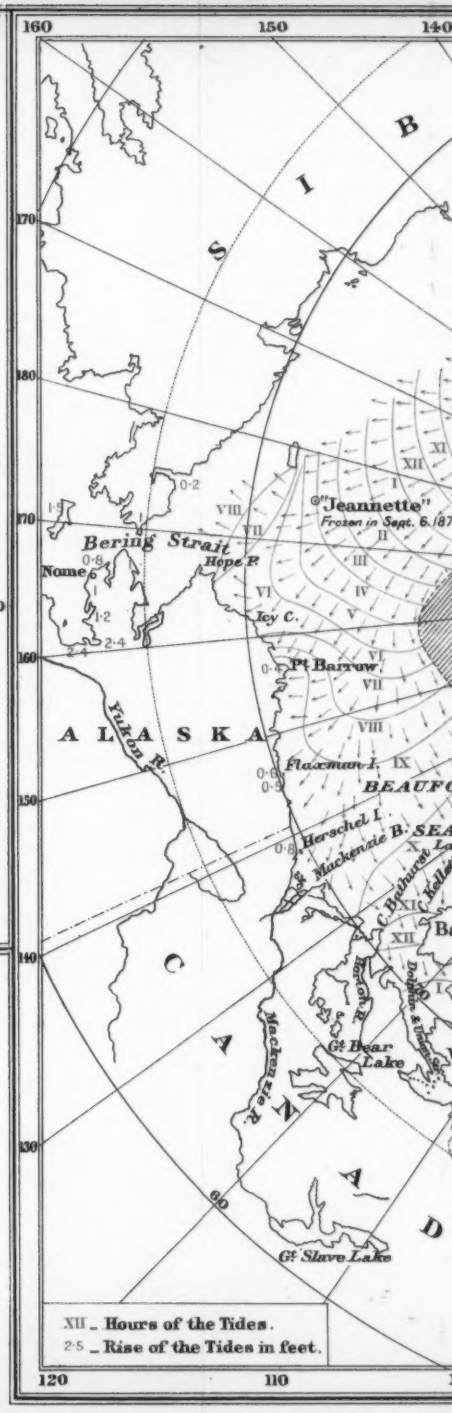
39°
40°
PORTUGUESE NYASALAND
LULI RIVER OR LURIO
Nivata
Nevio
Big bend from native information
Dense forest
Forest
Manukama
Naparara
Nankuta
Mt. Imbogi
Komala Range
Mt. Dwie
Mt. Impatwi
Semabu
Mt. Ira
Chaka's Country
Komala
Hostile natives
Komala's Country
M'Tabuli R.
Lora Lora
Npegla
Mrima Hills
Mzua Lashu Country
Mt. Nakaroa
Nakaroa
Namwiko
Mwaja
Imala
(From Portuguese military map)
Nampowa's Country
Rainho
Nua
Mt. Goti
Mt. Kadu
Niagai R.
Telegraph and road
Limestone
Crystalline
Nikuisha
Chief Ziglia
Mt. Kalage
High rounded Granite Bosses seen from Sipagni
Mt. Ariano
Mt. Koro
Mt. Mkye
Mt. Baratui
Mt. Mpapi
Kokuwi Range
Wekati R.
Mt. Majoni
Open forest
grassed
Mt. Natali
Mt. Talapola
Mt. Iriawi
Mt. Kokwi
Mt. Timwi
Mt. Havara
Open forest
Otitane
Mkonta
Jagaia
Mt. Tugwi
Mt. Tatagi
Mt. Mwiu
Nakawala
Mhala Hills
Malada H.
Natiwi H.
Hakwi H.
Nagahue
Umpagari Mt.
Niapala H.
Manahatala
Wanamhala
Maravi
Nambako
Ribawe
Shakota H.
Namitambo Hills
Erika H.
Palalani H.
Peone H.
Mlali R.
Namiesa
Ngiwi R.
Tibase R.
Mt. Namitiwi
Npadua
Camp
Open
W.N.W. forest
1000
Mt. Nyapali
Nakuloi R.
Kalwa R.
Nakuloi R.
Mt. Nakuwi
W. of L. A.
Mt. Ira
Mt. Impatwi
Mt. Dwie
Mt. Imbogi
Semabu
Nankuta
Naparara
Manukama
Komala
Nanuja R.
Probable course of river Mukuburi
Mukuburi R.
Mukuburi
Lora Lora
Npegla
Mrima Hills
Mt. Namisako
Waribia
Country of t
Mwaja
(Chief Umpawe
Nakaroa
Nakuburi R.
Tchirera R.
Pararo
Mt. Nakaroa
Namwiko
R. Namiaul
Swamp
Nikuisha
Chief Ziglia
Mt. Kalage
Mt. Tiwwi
Matuka
Mt. Iji
Mt. Kokwi
Mt. Timwi
Mt. Talapola
Mt. Iriawi
Kokuwi Range
Mt. Mpapi
Mt. Majoni
Mt. Natali
Purutunya
Malaku R.
Otitane
Mkonta
Jagaia
Mt. Havara
Open forest
Mpera

PORT. E. AFRICA
REID





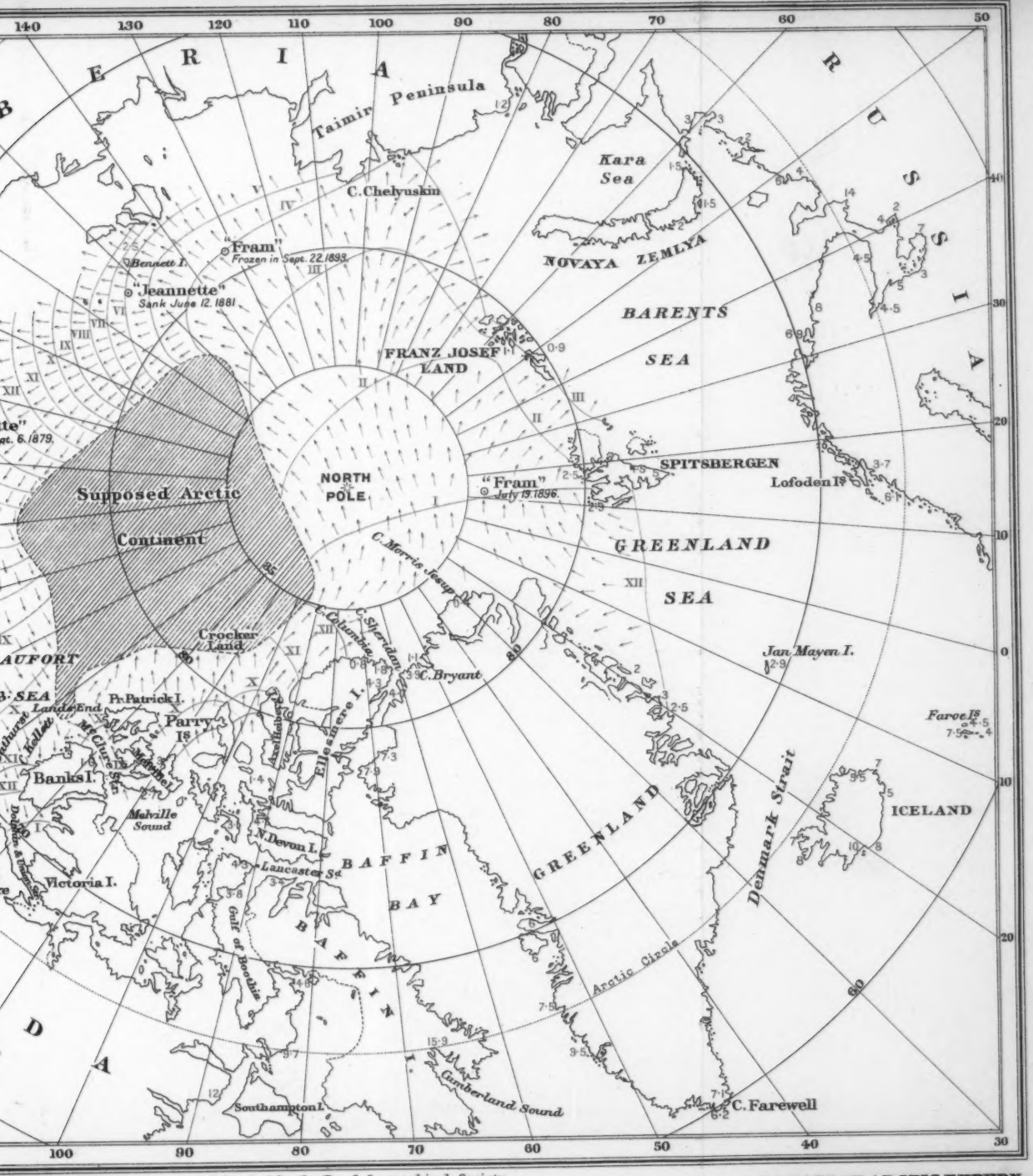
——— *Proposed Ship Route* -------- *Proposed Sledge Routes*

THE CANADIAN ARCTIC EXPEDITION

To illustrate the paper
by
V. STEFÁNSSON.

Scale, 1 25·000·000 or 1 Inch = 395 Stat. Miles.

100 0 500 1000



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CANADIAN ARCTIC EXPEDN
Stefánsson